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The Pennsylvania School Journal

DEVOTED TO SCHOOL AND HOME

EDUCATION

E. E. HIGBEE, EDITOR.

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J. P. McCASKEY,
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Butler's Series of Geographies.

The following letter, which speaks for itself, is submitted as testimony from competent authority, and will be read with interest:

Washington, D. C., January 14th, 1889.

E. H. BUTLER & CO., Publishers,
Philadelphia, Pa.

GENTLEMEN:—I beg to acknowledge with thanks the receipt of your communication of the 10th inst., together with a copy of your "Complete Geography (Pennsylvania Edition)" which I have looked over with the greatest interest. Too much cannot be said in praise of this magnificent work, and the fact that such a book is available for the instruction of American youths, no less than for "children of an older growth," is a striking commentary on the wonderful advance of educational facilities in the United States within the last few years. I think few can realize the thoroughness with which you must have ransacked every source of the latest and most reliable geographic information, in order to produce a work so fresh, original and complete. In the United States, for instance, I find you have utilized the latest publications of the Geological Survey, and I can myself recognize the graphic accuracy of your illustrations of Western scenery, unsurpassed in grandeur by anything in the world. Another improvement over other geographies is the representation of the depths of the sea, which you have given with great fidelity, so far as indicated by our latest knowledge. But the most striking and valuable feature of the whole book, to my mind, is the series of relief maps, which put it far ahead of any geography with which I am acquainted. Having seen some of the original models from which these relief maps were produced by photography and photo-engraving processes, and being acquainted with the gentlemen to whose artistic skill and geographic knowledge you owe the beauty and accuracy of these new and wonderfully graphic illustrations, I feel sure that there is no better way to get a correct idea of the broad features of continental structure than by looking at these superb maps. If I may offer a suggestion, it is that you devote a full-page illustration to each of them, and reproduce them by heliotype process, in order to avoid even the slight loss of effect due to the printing from a type-metal plate. The additional expense might not justify you in doing so, although I feel confident that the effect would be so greatly enhanced that it is well worth considering.

My interest in and admiration for the best geography by far that I have ever seen, must be my apology for venturing to criticise any feature of the book, and you have my full permission to print any portion or all of this communication; praise of such a work is like Shakespeare's description of mercy, "it blesseth him that gives and him that takes."

Very truly yours,

EVERETT HAYDEN,

In Charge of Division of Marine Meteorology.

THE
SCHOOL JOURNAL
ORGAN OF THE DEPARTMENT OF COMMON SCHOOLS AND OF THE STATE TEACHERS' ASSOCIATION.

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ARBOR DAY THOUGHTS AND FACTS OF INTEREST.

AT the opening of the last session of Congress its attention was called to the subject of forestry for the first time in any Presidential message. Bills for the protection and extension of forests are now before Congress and many State Legislatures. The last census presents striking facts which prove this to be a question of both State and National importance. The recent action of the National government shows a new appreciation of forestry. The marvel now is that the General Government did not earlier seek to protect its magnificent forests, once the best and most extensive in the world.

But of all these agencies no one has awakened so general an interest in arboriculture as the appointment of Arbor Day, by Governors of States, by Legislatures, and by State, county and town superintendents. The plan of Arbor Day is simple and inexpensive, and hence the more readily adopted and widely effective. In some States the work has been well done without any legislation. The best results, however, are secured when an act is passed requesting the Governor each Spring to recommend the observance of Arbor Day by a special message. The Chief Executive of the State thus most effectually calls the attention of all the people to its importance, and secures general and concerted action. How forests conserve the water-supplies, and lessen floods, is aside from the topic of this paper.

As the destruction of forests has been going on for centuries, the remedy must be the work of time, for it must include slow processes and agencies, each separately minute, which become important when multiplied by myriads and extended over broad areas. Arbor Day has proved such an agency. Four years ago the Legislature of Pennsylvania requested the Governor to appoint an Arbor Day. Such an appointment has been repeated each succeeding April, with a School Arbor Day appointed in October of each year by the State Superintendent of Public Instruction. The results have exceeded expectation.

The talks on this subject, which Superintendent Peaslee says were the most interesting and profitable lessons the pupils of Cincinnati ever had in a single day, occupied only the morning of Arbor Day, the afternoon being given to the practical work. Such talks will lead our youth to admire trees, and realize that they are the grandest products of nature, and form the finest drapery that adorns this earth in all lands. Thus taught, they wish to plant and protect trees, and find in their own happy experience that there is a peculiar pleasure in their parentage, whether forest, fruit or ornamental—a pleasure which never cloys, but grows with their growth.

Arbor Day has already initiated a movement of vast importance in many States. In tree-planting, the beginning only is difficult. The obstacles are all met at the outset, because they are usually magnified by the popular ignorance of this subject. It is the first step that costs—at least, it costs effort to set the thing on foot, but, that step once taken, others are sure to follow. This very fact that the main tug is at the

start, on account of the inertia of ignorance and indifference, shows that such start should be made easy, as is best done by an Arbor Day proclamation of the Governor, which is adapted to interest and enlist the youth of an entire State in the good work. When the school children are invited each year to plant at least "two trees" on the home or school grounds, the aggregate number planted will be more than twice that of the children enlisted, for parents and the public will participate in the work.

The influence of Arbor Day in schools in awakening a just appreciation of trees, first among pupils and parents, and then the people at large, is of vast importance in another respect. The frequency of forest fires is the greatest hindrance to practical forestry. But let the sentiment of trees be duly cultivated, first among our youth, and then among the people, and they will be regarded as our friends, as is the case in Germany. The people need to learn that the interests of all classes are concerned in the conservation of forests. Through the teaching of their schools this result was long since accomplished in Germany, Switzerland, Sweden, and other European countries. The people everywhere realize the need of protecting trees. An enlightened public sentiment has proved a better guardian of their forests than the national police. A person wantonly setting fire to a forest would there be looked upon as an outlaw, like the miscreant who should poison a public drinking-fountain.

FORESTRY WEEK IN THE SCHOOLS.

Arbor Day should and doubtless will be celebrated with special exercises, in which it is to be hoped that tree planting as well as speech making and singing will be included. The occasion, however, should not be allowed to pass without calling the attention of the pupils to the practical as well as the sentimental and æsthetic reasons for encouraging tree-planting. In order to fix in the mind of every intelligent pupil the various reasons which make forest renewal important, it would be a good plan for the teacher to give a short talk on the subject every day of this week, followed with questions calculated to test the thoroughness with which the pupil has grasped the lesson in forestry. A very few plain words will be enough to impress the children with the facts that forest exhaustion tends to produce droughts and floods, by reducing the power of the surface soil to absorb and retain moisture, and hardens it so that the rain runs off and makes the streams rise suddenly; that the destruction of vegetation reduces the healthfulness of the atmosphere by diminishing the leaf surface that absorbs carbonic acid which our lungs give off, oxygen which our lungs absorb; and that violent wind storms increase where the resistance that forests make to their course is diminished. Moreover, the increased price of lumber, a necessity of civilization, and the reduced volume and quality of water in streams, are arguments that can be understood by every child. In short, without neglecting any of the ordinary studies, this week can with very little extra trouble be made to figure as Forestry Week in the public schools.

SANITARY VALUE OF TREES.

Dr. Stephen Smith recently read a paper before the New York Academy of Sciences on the sanitary value of trees in the city. It is a well known fact that during the intense heat of summer there is more suffering and death from sunstroke and high temperatures in the Northern cities than in the South, a result which must certainly be attributed to the absence of suitable protection. From three to five thousand people die every summer in the metropolis from the effects of the heat. In the arid, treeless streets and avenues the temperature often runs from 130° to 150° Fahr., when under the branches of a thrifty shade tree it would not exceed 70° or 80°. In the absence of sheltering trees, the stone and brick walls act on the principle of the regenerative furnace, and absorb the heat of the sun to yield it up again during the night. If trees were planted in the streets, the pavements and surrounding walls would be much cooler, and at the same time the trees would absorb the deleterious gases thrown off from the lungs and from decomposing matter, yielding, in return, a supply of pure oxygen. The value of a systematic culture of trees in all of our large cities can hardly be estimated. From both a sanitary and artistic standpoint they are a very desirable addition to any city.

There are about 70,000 trees in the streets of Washington. The principal varieties are the Norway, Sugar and Silver Maple, the Carolina Poplar, the American Elm and Linden, the Tulip tree and the American Sycamore. There are also a few honey locusts. Congress makes an annual appropriation of $18,000 for tree planting in the streets and reservations of the city. These

trees, if planted in a solid block, would form a forest of 600 acres. It is to be remembered that the vast majority of these trees have been planted in the last 17 years, since the present Board of Park Commissioners were endowed with full powers to plant and maintain trees along the public thoroughfares. Householders have no authority to remove trees from the sidewalks in front of their houses, but any reasonable complaints, either regarding the interference of trees with sunlight or air, or regarding the injudicious removal of trees, receive attention. The city maintains its own nurseries, and is therefore enabled to plant trees at a much smaller cost than they can be planted for in most cities. Each time that a tree is planted, a space six feet in length, two and a half feet in width and two feet in depth, is excavated and filled with good surface soil. No manure is used. As a rule the trees thrive. Double rows are now generally planted on both sides of the principal streets and avenues. The trees appear to have already accomplished much good by furnishing a grateful shade during the hot weather, and have contributed not a little to make Washington what it is—the most beautiful city in America.—*Forest Leaves.*

Teachers can easily interest their pupils in adorning the school grounds. With proper pre-arrangement as to the selection and procuring of trees, vines, or shrubs, Arbor Day may accomplish wonders. Many hands will make the work merry, as well as light. Such a holiday will be an attractive occasion of social enjoyment and improvement. The parents should be persuaded to approve and patronize the plan. It tends to fraternize the people of a district, when they thus meet on common ground, and young and old work together for a common object, where all differences of rank, or sect, or party, are forgotten. The plantings and improvements thus made will be sure to be protected. They will remain as silent, but effective teachers of the beautiful to all the pupils, gradually improving their taste and character. Such work done around the school naturally extends to the homes. You improve the homes by improving the schools, as truly as you improve the schools by improving the homes. "The hope of America is the homes of America." Our youth should early share in such efforts for adorning the surroundings of their homes and planting trees by the wayside. How attractive our roads may become by long avenues of trees, is beautifully illustrated in many countries of Europe.

It is well that the school children should assist in the planting, particularly on their own domain,—the bare, treeless school grounds. The deserts to which many young school children are assigned to romp in are disgraceful to their neighborhoods. This matter has been discussed at County Institutes, and in Superintendents' reports for years, but hundreds of these arid wastes, by courtesy called play-grounds, still exist. The creation of Arbor Day will be amply justified if it corrects this one evil. With the planting may also come theoretical instruction upon the value of wooded tracts in the equable distribution of rainfall, the prevention of sudden inundations, and the effect of vegetation upon health. Once a year there is an Arbor Day for everybody. Attention is called to it by the Governor. The newspapers impress the day and its objects upon readers for weeks in advance, but it is quite clear that a very great change must be wrought in the mind of the entire community in the old States before very much that is tangible can be done in this work. The State Society organized to bring the subject home to the people is doing what it can, and few county societies have been organized. It is in the old counties, where the ravages of the axe have been levelling the monarchs of the forest for two centuries, that it is reasonable to look for the initiative steps toward restoration; but before much can be looked for practically, the public must be impressed with the vast present importance of tree-planting and its immeasurable consequences in the remote future. The public mind has not yet received this impression in any marked degree, and it requires continuous organized effort to produce it.

Our youth should learn to forecast the future as the condition of wisdom. Tree-planting is a discipline in foresight—it is always planting for the future. If the hundreds of thousands of pupils attending the schools of Pennsylvania should each plant two trees, as is attempted in some of our States, we would have nearly two million trees planted in a single year. At an early day, when public interest is duly awakened, more than this may be expected. Hence this subject should be taught in our schools. The objection at once arises, "the course of study is already overcrowded," and this fact I admit. But the requisite talks on trees, their value and

beauty, need occupy but a few hours at different times. In some large cities, there may be little or no room for tree-planting, and no call for even a half-holiday for this work; but even there such talks, or the memorizing of suitable selections on trees, on the designated day, would be useful. Such oral lessons will lead our youth to realize that trees are the grandest products of nature and form the finest drapery that adorns this earth in all lands. Thus taught, they will wish to plant and protect trees, whether forest, fruit, or ornamental. Like grateful children, trees bring rich filial returns, and compensate a thousand-fold for all the care they cost. Such love of trees, implanted in the school and fostered in the home, will make our youth practical arborists. The maples which I planted when a mere boy before the old homestead, now stately trees, have added new charms to that beautiful spot to which I deem it a privilege to make an annual visit. Among the memories of my boyhood, no day recurs with such satisfaction as that then devoted to tree-planting. The interest thus awakened has grown with years. I should be thankful if I could help put an equally grateful experience into the memories of the youth of Pennsylvania on their Arbor Days—one which they will never forget. Let me urge each one on these annually-recurring days to plant trees, vines, shrubs, or flowers around the home, even if there is no room on the school grounds. Thus an impress will be made on *minds*, as well as grounds, that will be happy and lasting.—*Northrop.*

An Illinois correspondent of the *Country Gentleman* writes: "I have planted more or less walnuts every year for the past ten years. I plant them as soon as ripe, and when the ground is soft enough to stamp them in with my boot heel. I sharpen a stick four feet long, of sufficient size so that when thrust into the ground it leaves a hole large enough to receive the walnut and hold it in its place. I stretch twine where I want a row of trees. I let one man go ahead with the sharp stick, thrusting it into the ground where a tree is to grow. Another man follows and drops a nut into each hole made with the stick, and stamps it with his heel. It must not be sunk more than one quarter or half an inch below the surface. This is the only way by which I could get straight rows. If the nuts are dropped in a furrow, or on plowed ground, the tree will be four to six inches on one side or the other of a straight line. They will freeze, if planted in the fall, but this is what I want, for unless they do freeze some of them will remain dormant two or even three years. If planted as I direct, and the nuts are sound, not ten out of a thousand will fail to grow. After walnuts get dry it is not safe to plant them. I have let them remain in a pile all winter and planted in the spring, and had many to grow, but fall or an open time in winter is best.

But one conclusion can be drawn from the reports from most of the counties of the State; vis., that the forests of Pennsylvania will be totally destroyed before very many years, unless something effectual is done, both to preserve the young growth following a clearing, and to plant new forests equal in extent to those cleared away. There are eleven distinct varieties of trees which flourish well as timber trees, and for which there is more or less demand. Under the general names of oak, hickory, ash, pine, and elm almost as many more are included, making about twenty varieties of timber-producing trees, more or less adapted to our State. The chestnut does well in forty-six counties, and is in demand in forty-one counties. There is an active demand for white and yellow pine; and almost no supply. The catalpa, ailanthus, northern shingle cypress, shingle oak and the common cherry, so much valued by cabinet workers, grow well under cultivation.

Up to the present time twenty States have appointed Arbor Days. This shows the feeling that is abroad concerning their value. Doubtless every year will add to their number, until the entire sisterhood of States will have fallen into line. It is an institution needed everywhere. The stony and sterile soil of New England requires forests for its improvement and to prevent the floods which are growing more frequent year by year. We need them in the Middle States to preserve to us the productiveness of our lands. They are required in the West to interrupt the cyclone's deadly sweep, and everywhere in the interests of the health and general welfare and prosperity of our people.

A contract was lately concluded by the Mexican Government with a private party to plant 2,000,000 trees within the valley of Mexico within four years. The trees specified are chiefly ash, poplar, acacia and mountain cedar, with a sufficient margin for miscellaneous kinds, according to special

conditions of site and climate; and the arrangements contemplate the formation of national nurseries in which the study of scientific forestry may be pursued on a footing in some degree commensurate with its importance. The valley was densely wooded in the time of Montezuma, when Cortez and the Spaniards entered the country; but the Spaniards burnt off and destroyed the timber.

In referring to the Pennsylvania Forestry Association the *Philadelphia Ledger* says: "It is a protective society intended to make every Pennsylvanian live up to the title of his State by his interest in the woods. Of all States this is the one which should never be bare of trees. None other has such a title to be proud of."

Depots for the collection of pine cones have been formed near Burlington, Vt. Nearly 4000 bushels have been purchased at 40 cents a bushel. The seeds are flailed out, placed in bags, and shipped direct to France and Germany, to be used by these governments in renewing the forests. One bushel of cones yields a pound of seed.

THE STORY OF A SCHOOL.

BY JAMES JOHONNOT.

IN this age of wholesale educational machinery the faithful record of any school, individual in its character, ought to be of interest to all who seek better results in practical ability than our present systems of instruction succeed in giving. But, when the school departs widely from recognized standards, its record is of double value, as calling in question prevalent customs, and affording a new criterion for the judgment of current methods. The tendency of instruction is to become set in its ways. Teachers follow precedent and reach formalism.

But from time to time particular individuals are found who ask the reason of this or that practice, and call in question its value as a means of culture. Hence arose the "teachers' institutes" in this country. They were first organized in the State of New York, in 1846. They grew naturally out of the progress in liberty of thought. Time-worn methods of teaching were brought up for discussion and judged by their results, and in the light of reason.

Credit is surely due the founders and conductors of institutes, in that they brought about and persisted in this habit of questioning and discussing educational practices and principles. This was their special field of work. Their method was the true one, but the laws of life and of mental development were not then well enough understood, even by the best thinkers, to furnish safe guidance in this difficult work.

"The new education" means a revolt against all precise, ready-made forms, and an adoption of such methods as science may from time to time discover and point out. The "Story of a School" tells of the trials and triumphs of an experiment designed to test educational principles at which I had arrived through many years of "institute" instruction. In this constant comparing, discriminating, and sifting of methods I had obtained a special preparation for normal-school work. Herbert Spencer, in his treatise on education, had laid a solid foundation for scientific education, and Prof. E. L. Youmans had with voice and pen succeeded in arousing among thinking people a lively interest in the subject.

In the year 1872, through the agency of Hon. John Monteith, Superintendent of the Schools of Missouri, I received a call to take charge of the newly established normal school at Warrensburg in that State. In the interview with Mr. Monteith I said suggestively to him, "You do not want me, and your board of regents will not want my services when they learn the conditions I shall exact." "What may these be?" said he, with some curiosity in his tone. "Entire control of the school, without interference from the superintendent or from the regents," was my reply. Laughing, said he, "You are the very man we want," and added, by way of caution: "You understand that liberty implies responsibility. Give us right results, and we will trust to you for methods." I accepted the situation, and took up my work under circumstances singularly propitious to the experiment I was about to make.

The first thing that engaged my attention was the preparation of a course of study. It was an easy matter to select the required document from the catalogue of some noted institution, or I might have made a mosaic, adopting parts from several. A brief inspection of various catalogues showed that little thought had been bestowed upon the order of subjects in the course. One study might be made to take the place of any other, without the slightest disturbance in their relations. Of the natural order of growth in mind and of the corresponding se-

quences in the sciences, they had taken no account. To these laws I now turned for guidance, and tried to forget that a school curriculum had ever been constructed, so that custom should in no wise interfere with the free play of philosophic principles.

The subjects were arranged in their order of dependence as determined by comparative science. The course of study thus worked out differed quite materially from the ordinary, in spirit and in principles. It emerged as an organic whole, rather than as a loose array of disconnected subjects.

The physical sciences had first place, their treatment beginning with an observation of material objects, and passing to a consideration of forces and of the laws of physical relations.

Another line of study treated of man and his environment. It began with a consideration of man as an inhabitant of the globe, dealing with geography, and it led up through history, literature, civil government, to mental and moral philosophy, and later on to rhetoric, logic, and political economy.

Besides these two main lines of thought, there were two subordinate ones, dealing respectively with language as a science and with mathematics. In our treatment of language the widest departure from the customary was made. Latin and Greek were excluded, as the State University already offered a much more complete course in the classics than our school could hope to give. But a still weightier reason constrained me in this decision. The time at our disposal for linguistic study was needed chiefly for constructive work in the vernacular. I determined to make the study of English thorough; I realized the power gained by an accurate and easy mastery of our own tongue, and I fully appreciated the æsthetic value of English literature in the cultivation of a refined and discriminating taste.

The constructive work was so managed that familiarity with composition preceded analysis, and the principles and rules of language were developed out of the pupil's own work. Grammar came out of language, not language out of grammar. The critical work of grammar and rhetoric was placed in the advanced course along with logic.

In this spirit, and by the general method here indicated, the whole course of study was arranged. The place occupied by each subject was not a matter of accident, but of philosophic dependence. The success of my scheme demanded intelligent and harmonious co-operation on the part of the faculty. I needed a select corps of teachers, and the freedom of choice secured to me by Mr. Monteith now proved of great importance.

For my first assistant I chose Prof. L. H. Cheney, who some years later was accidentally killed while making an excavation in connection with the work of a geological expedition under direction of Prof. Shaler, of Harvard. In years long gone by Prof. Cheney had been a pupil of mine; later we had worked together, so that I knew well his peculiar worth and fitness for the place.

Next came Prof. and Mrs. Straight, representatives of the most advanced thought of the time in educational philosophy. They brought original and fruitful contribution to the work now in progress, and henceforth were to me as my right and left hand. At the close of his stay in Missouri, Prof. Straight was called to the charge of a department in the Oswego Normal School. Later he went with Colonel Parker to the Cook County Normal School, Illinois. He gave all the energy of an intense nature to his profession, but died in middle life, his mind a storehouse of educational material, ripe for use. Mrs. Straight's refined intelligence and professional skill found equally ready appreciation, and she took a high position in each of these normal schools. Since her husband's death, she has been called to a responsible position in one of the state schools of Japan. The remaining members of the faculty were chosen for their fitness in special directions. The plans of each had their recognized place in a co-ordinate work. One of the chief defects in colleges and academies to-day is this lack of co-ordination. Without it the scientific method in its integrity is impossible, and instruction proceeds as though each science were independent. Time and strength are laboriously frittered away, with the result of chronic discouragement on the part of both professor and students.

"I declare," said one of our most observant pupils, as he came out from recitation one day, "the teaching in all the classes is somehow alike! It makes no difference whether we are in natural science, mathematics, or language, we are going the same road, and each lesson throws a new light upon all the others."

When the summer school at Penikese was organized, we made prompt application for a share in the rare opportunities offered. Only fifty students could be accommodated.

Three of our teachers received the appointment, and accompanied me across Buzzard's Bay on that eventful summer morning in 1873. Agassiz "the master" was there, his face hopeful and inspiring. The last and noblest experiment of his life was about to be tried, and everything promised success. The promise was fulfilled. The many summer schools of science, springing up all over the land, are the direct offspring of Agassiz's realized dream; and the increasing recognition of the fundamental value of science by numerous prominent schools is also largely a result of his Penikese experiment. Our teachers again, the second summer, made haste to profit by the advantages of the Penikese school, and returned to their work in Missouri with added skill and devotion.

Our pupils represented every class of society. We opened with seventeen, and rapidly increased till the roll contained four hundred names. Within the limits of this paper only the bare outlines of our methods can be given. We began with the properties of things. The gardens and fields were open to us, and furnished us the objects. When familiar with these and their relations, books were brought in to extend our knowledge beyond the limits of personal experience. The zoölogy and physiology classes, under Prof. Straight, were at once engaged in laboratory practice. They obtained their knowledge of the animal world from direct observation and through actual dissections. The neighborhood was laid under contribution for cats. Any feeling of repugnance at first shown for the work soon passed away as interest in the study grew eager and absorbing. The absurdity of rote teaching was shown by an incident in the professor's class-room.

One day he called the attention of the class to the description of a certain sea-animal, as given in a popular text-book. This description he asked the pupils to commit to memory, which they proceeded to do, wondering why. One morning, only a few days later, the table was furnished with a specimen of this same animal preserved in alcohol. Not a member of the class recognized it. The elaborate verbal definition had given them no correct idea of the animal, if, indeed, any image whatever had been present in their minds.

In botany, books were unopened, except to aid in analysis. Materials for study the students found in their walks, and the keen delight awakened when examination revealed to them this new world of facts left no doubt that this was the very method of nature. The study went deeper than systematic botany, and led to an extended investigation of life processes in the plant.

Physics was taught in the laboratory and illustrated by apparatus which teachers and pupils united in making. This proved of double value; for, while primarily it helped to solve the problem in physics, incidentally it constrained the pupil to test knowledge previously gained by its practical application. The inventive powers were also stimulated, and a long step was taken in the development of faculty.

The teacher of geometry followed the method of Prof. Krüsi, of Oswego. This, in essentials, is the same as that outlined by Herbert Spencer in his work on education. It was developed incidentally out of the needs of constructive art, and was carried forward slowly, as the gradual progress of the pupil called for further applications of its principles. It was specially gratifying to witness the cheerful activity of pupils in this line of work, so often dreaded and shirked, and to watch the stimulating effect of power gained in mastering a difficult problem.

Drawing came in everywhere, being a mode of expression as natural as language, and indispensable to the acquirement of clear ideas; pupils soon made constant use of it, though, from lack of early training, their efforts had no pretensions to artistic merit.

Our lessons took various forms, depending upon the object we had in view. In the development exercises, by a series of questions quite in the Socratic spirit, we brought together the wandering, disconnected ideas which the class possessed upon any subject, and directed attention to the more obvious relations. The pupils were then left to work over the lesson, and arrange and present it in due order. This process became a guide, and pointed out the way for the next step in investigation. Lessons of instruction were usually given in the form of lectures. We however varied this exercise by substituting for the formal lecture a more or less familiar conversation, in which, after a little, all pupils took part.

Topical recitations included all knowledge obtained from books or reported from investigation. Day by day pupils were called upon to tell what they knew of given subjects in clear and connected discourse. The words of the text-book were not accepted; so every lesson became a language-lesson of the most practical kind. As a

matter of fact, we found that, whenever a new thought was clearly understood, the mind sought expression in some form, either through constructive work, drawing, or language, and was not content until it had clearly imparted its meaning to another mind. The mental circuit was then complete.

In this reaching out after words and forms individual character asserted itself, the imagination was awakened, the invention quickened, and the dead monotony of the old-school recitation disappeared completely. This training finally resulted in an unusual mastery of spoken language.

Written work held a large place in our school. Our plan made provision for at least one written exercise a day for each pupil. As these exercises were in connection with the studies pursued at the time, the pupils entered upon them without any consciousness that they had begun the dreaded composition. Lessons from text-books, and aided by books of reference, were treated topically, and were frequently written out. Investigations in science were reported in writing, and in due time the pupils came to think easily and naturally, pen in hand.

In another regard we made a serious innovation upon custom. The teachers were not required to correct the wearisome mass of papers prepared daily. For this we had good reasons. The free use of criticism is a dangerous practice. It paralyzes the imagination of the pupil, and so depresses and discourages him that original constructive work is next to impossible. And if, as so often happens through the training given, the critical faculty of the pupil is developed in advance of the constructive ability, and of the power to use language with ease and accuracy, the result is fatal to progress in composition. The first rude efforts fall so far short of the polish demanded by the critical spirit that the sense of discouragement is overmastering.

There is still another view of the case that makes for the same distrust of promiscuous criticism. The errors of the early compositions are soon naturally and spontaneously outgrown through the constant effort at clearness of expression, and through the rapidly increased power over language gained by this continuous practice. In this way the mastery of language came incidentally, and we avoided the stiff awkwardness of the conventional composition.

In the study of English we did what we could to awaken the literary sense to some degree in all our pupils. We knew that each one came into the world with definite mental limitations. The literary sense, like any other form of the artistic faculty, seems, with rare exceptions, to require several generations of culture in a scholarly atmosphere before it attains to a fine discrimination. But we could at least make a real beginning. We could find out the present state of their taste, and carry forward their development by guiding their course of reading. Advantage was taken of events to bring before them some special poem, or some impassioned prose composition, having relation to the event in question. We could thus awaken a susceptibility of the soul, that through repeated impressions would develop into an instinctive sense of the beauty of true literary art-forms.

This was our aim, and quite subsidiary to this was the acquisition of knowledge *about* literature. The history, bibliography, and philosophy of English literature must come later, instead of usurping the first place, as is commonly the ease in schools.

In language, Prof. Campbell prepared an exercise which proved of great value. He selected about three hundred of the most productive roots of English words, and gave them one by one to the class. They traced these roots back to the various languages entering into the English tongue, and thus acquired a broader view of the origin and relations of English words. The study thus bestowed upon the vernacular was further valuable as furnishing a basis for the study of other languages.

When the student in Latin, French, or German finds that a large number of the new words he is learning have the roots with which he is familiar in his mother-tongue, the difficulties of his work are greatly diminished.

Mental and moral philosophy were taken up objectively and without the aid of books. Prof. Straight first developed the relations which knowledge sustains to mind, and the action of mind under varying conditions. He then took up some familiar subject, and called upon the class to apply the knowledge thus far gained. For example, a flower was brought in and analyzed according to the laws of systematic botany. Then came introspection: what powers of mind had been used, and in what order? A lesson in geometry came next, and this was followed by the other school studies, until the list was exhausted. Next came the industries: what mental powers are brought into play in raising a crop, in build-

ing a house, in boiling a potato, in the making of bread? By this plan mental philosophy was lifted out of the fog of dreary abstractions, and set on its feet in the broad light of every-day life.

Moral philosophy fell to my share. No books were used. My methods were quite similar to those of Prof. Straight. In a series of discussions, extending over several weeks, the human being was taken where Prof. Straight left him, and the relations developed that existed between him and other human beings. Needs were shown to exist by virtue of the "constitution of things," and deeper than this we did not attempt to go.

Human beings were seen to be *potentially* equal in needs, hence the necessity for equality before the law, that all might have opportunity for their natural development. Out needs grew rights, and out of rights duties. A study of experience soon showed that duty assumed two phases—positive and negative. Confucius is credited with a maxim covering the ground of negative duty—forbidding injury to your neighbor; Jesus enunciated a law that summarized both positive and negative duty.

Next, the principles derived from this preliminary study were applied to the conditions which exist in school, home, and neighborhood. Why should a person work? What time should be given to recreation? What shall we do with the tramp? What with worthy but destitute men and women? What with needy orphans?

The discussion was conducted almost solely by the pupils. When it took too wide a range, the teacher quietly led it back to the question at issue. The lesson on one occasion dealt with card-playing. One young woman charged that it led to gambling and bad company. To this another replied that she had often played but never for money, nor had she the least inclination to gamble. As for bad company, she played with her sister, who was no worse company at the card-table than at the dinner-table. When I found that the discussion had become a mere assertion of opinion, I interposed: "You seem to disagree. Why?" "Yes," said one, who recalled my method of treating such cases, "we have not facts enough to enable us to form an intelligent opinion." "But," said another, "what is your opinion?" "My opinion is not the question. What are you to do next?" Wait, observe, and continue to study, was the conclusion.

Our history grew out of our geography, and, as we labored to build up in the mind of the pupil a connected and distinct picture of the skeleton—the mountain system of the globe—and then clothed these gaunt outlines with the trailing robes of continental divisions, showing also the necessary dependence of the water systems upon the great backbone of the continents, so in history we aimed at a unity of conception, we sought to develop an historic sense, which, once acquired, serves as a guide through the mass of unrelated facts filling so large a space in historical works, even of the higher order. This kind of training is too complex for description here.

And so of our methods of discipline: they were all intricate and intimate parts of our whole work. We had no rules, no class-markings, no roll of honor. We rejected the whole military system, as tending to produce mechanical, routine work. The abrupt tone of command was not heard within our walls. Directions were given in the form of requests. Teachers and pupils observed toward each other the usual courtesies of social life. No premium was offered for study: we relied on the natural incentives. Exercise of faculty is the chief source of pleasure in the young, and we furnished abundant scope for it. The time being filled with pleasurable occupations, calling into activity the whole nature, there was less temptation to misdemeanors than in the ordinary conditions of home-life.

Herbert Spencer's essay on moral education will best describe the work as it went on in our school, subject to the imperfections of human nature it is true, but with a result in general most gratifying.

The school as a whole soon attained a character of its own, derived from the aggregate of its members, and, reacting upon them, it became a potent force in stimulating the moral growth of individuals. This aggregate moral power was exerted for the most part unconsciously, but it was effective, and in time reached proportions which rendered my interference unnecessary.

An incident will here illustrate the operation of this power. A youth entered our school who had formerly been employed as train-boy upon the railroad. His experiences had greatly sharpened wits naturally keen, and as he came among us he was plainly seen to be an alien element. His evil propensities soon showed themselves. He told foul stories, but could get no listeners. He tried to pick quarrels with the

younger members of the class, but a quiet word from one of the older pupils soon put an end to that; and, finally, he became angry and disgusted, and took himself away permanently. I watched this affair with much interest as a psychological experiment, but with some anxiety lest the moral leprosy should spread; but the character of the school told, and I was superfluous.

Another instance discloses something of the spirit prevailing among our students. The use of tobacco was discouraged incidentally in a variety of ways. We had a beautiful new building, and great care was taken to preserve it free from filth of any kind. A tobacco-stain, when observed, was removed at once with scrubbing-brush and sand. The physiology class, too, came upon the question of the action of tobacco upon the tissues of the body, and, besides, there was felt to be a social discredit in its use. One evening, while waiting for the mail at the post-office, a number of students on the same errand gathered about, and our talk turned on school matters. Allusion was made to our freedom from the restraint of rules. A late comer remarked: "But you have one rule, I understand. No one must use tobacco on the school premises." I assured him that, though I was opposed to the use of tobacco, I did not prohibit it. "But," I said, "no gentleman will soil the floor of a room occupied by ladies; and this fact being understood, prevents its use more effectually than a positive prohibition." So powerful was the social reprobation of this filthy habit, that forty young men, of their own will, gave up the practice. It will thus be seen that our moral training, too, was largely incidental; it was implicit in every detail of school-life.

As will already have been anticipated, we dispensed with all distinctive religious services. I had carefully observed the effect in school and college throughout a long period of years, and had been forced to conclude that the evil results vastly outweighed the good. I had noticed that stated Bible-reading often became a mere lifeless form, in which many took no interest. This was contrary to the whole spirit of my system. "Vain repetitions," leading to a habit of regarding words apart from thought, were to be carefully avoided. Then, again, the teachings were dogmatic, appealing to authority, while science regards authority as an impertinence. Besides, the Constitution of the United States places its whole machinery upon a strictly secular basis, and religious services in a State school are there upon sufferance. No matter how carefully guarded, the daily performance of any religious service degenerates into formalism, and excites in the community sectarian animosities.

But, above all, I wished to place morals upon a scientific basis, so as to furnish a safe guide to conduct, independent of the shifting standards of theological belief. We, who received our appointments from the State, could not, honestly, either promote or attack any form of religious belief. Happily, the scientific method equally forbids doing either of these things, and, if strictly adhered to, will prevent all possibility of such quarrels between religious sects as have recently agitated Boston, and have from time to time interrupted the work of many schools in this country.

Our position on this question occasioned wide spread comment, and among the clergy of the more ignorant and bigoted sects, there arose an opposition, instinctive rather than outspoken.

The Missionary Society voted us a Bible, and I received a formal note from the secretary announcing the fact, and requesting me to appoint a time for the presentation to take place. I had been informed privately that, as soon as I fixed the time, a public meeting was to be called, and an address made denouncing our neglect of religious observances. In answer to the secretary, I informed him that our library was richly supplied with Bibles, but that, as a token of confidence and good-will, their gift would be highly prized, and we would gratefully receive the promised Bible at the president's office in the normal school building, at such time as was most convenient to the secretary. The Bible never came.

Prof. Campbell, of our faculty, gave testimony of considerable significance concerning the moral atmosphere of our school. He had been educated in a sectarian college, and had been graduated at a theological seminary. All his prejudices were enlisted in favor of a daily religious service. He said: "I am at a loss to account for the uniform good feeling existing between teachers and pupils here. No student seems disposed to annoy or vex a teacher, and the moral tone of the school is much higher than I have before known." At first, he had thought that the good-will prevailing was in spite of the omission of religious services; but a more careful study had convinced him that the system, in its integrity, had created the moral atmosphere that pervaded the school.

Examinations, as usually conducted, had proved fruitful of serious evils. They gave opportunity for cram, and were often an occasion for cheating. When formal and stated examinations are held, on which class promotion depends, there is a strong inducement to make spasmodic efforts of memory serve in place of sound learning. We avoided these evils by a simple device. Examinations were held at irregular intervals, and were of such a nature that no miraculous feat of memorizing could meet our requirements, Repetitions of text-book formulas were habitually in disfavor, and necessarily there grew up habits of genuine study. These reviews were found sufficient aids in testing progress, aud we dispensed with all other examinations.

After some effort toward conformity to prevailing custom, we found ourselves constrained by the guiding principles we had adopted to devise some more genuine repre-representation of our year's work than is possible in "closing exercises" of the regulation pattern. Essays upon the subjects usually chosen had no essential relation to the student's past researches, and, being prepared for the occasion, represented nothing in particular. Besides, they are not uncommonly doctored by the teacher of rhetoric till they are of doubtful originality. We finally dispensed with all special preparation, and discarded all the spectacular features of the ordinary commencement.

One day was given to the public. Every four weeks during the year our pupils had been accustomed to select some subject having close relation to their studies, and to give time and care to the preparation of an essay upon it. These papers were preserved, and from among them each member was required to choose and bring one. On the last day of the term the public came in, and those interested stayed and listened to the reading of these essays. The truthfulness of every step was plain to all concerned, and was thus in accord with the spirit of the school.

Our experiment came to an end. Of the various innovations made upon custom each had justified itself. The effort to make character the end of education had more than fulfilled expectation. During the last year not a single case of misconduct was reported to me, nor was the behavior of one of our students criticised by the citizens. We had a reign of influence. The forces that govern conduct came from a growth within of just and kindly impulses. A watchful supervision had always been maintained, but into this had entered no element of espionage. The peculiar character which the school attained, both on its mental and moral side, was due to the several factors of influence—scientific methods in study, philosophic succession of subjects, and a never-ceasing but an apparently incidental attention to moral training.

Through the strong personal influence of the State Superintendent, Hon. John Monteith, my independent position had been maintained. I had enjoyed entire freedom in the management of the school and in the selection of teachers. During the three years of my stay in Missouri, educational affairs were in a transition state. At the close of the war, the public school system was organized and protected by constitutional provisions. The best results of Puritan experience for two hundred and fifty years were incorporated in its provisions, and made secure so far as legislative enactments could compass it. More progress was made in the State during the few years of the so called carpet-bag rule than in all its previous history. A State Board of Regents, non-partisan and largely professional, were in control throughout our first year. But the rebels were enfranchised, and reaction at once set in. The State Board was abolished, and a local board created, by its very constitution hostile to ideas.

Naturally, personal and sectarian interest would find expression. Members of the local board could see no reason for holding the office, when their functions were restricted to paying over money into the hands of Yankees, to be largely spent in the East during vacation.

Of the special influences that finally brought our experiments to a close it is unnecessary to speak in detail. Suffice it to say that our chief opponent stood before the people as a representative of wealth, and as the most prominent supporter of all religious enterprises. But below the sanctimonious exterior were the predatory instincts of the barbarian. His betrayal of trusts, his flight from outraged justice, his disappearance in the wilds of the Far West, his discovery at a lonely wayside inn, on a road leading to a mining camp, prostrated by illness, without help, and hunted to the grave by detectives, afford a spectacle so gloomy that even retributive justice is shocked at the recital.

Recent experiments, introducing as we did the constructive arts as a means of expression, have again demonstrated their

educational value; and I am persuaded that some time in the future the scientific method, with its freedom from arbitrary restraints, its ethical aims and accomplishment, will in its completeness take control of our leading educational institutions.

Popular Science Monthly.

A SAMSON IN HARNESS.

EXHIBITION IN CHICAGO OF THE NATIONAL ELECTRIC LIGHT ASSOCIATION.

THE annual convention of the National Electrical Association was formally opened February 20th, in the Exposition Building. It was called to order by President Duncan of Pittsburgh. A brief address of welcome was made by City Electrician Barrett, who officiated in the absence of Mayor Roche from the city.

President Duncan responded on behalf of the Association and then delivered his annual address. He referred in opening to the organization by a handful of men in this city five years ago this month of the movement from which has grown the large and powerful association now assembled in convention. At first arc lighting was the all-important question, then the problems of incandescent lighting, electrical distribution of power, first for stationary motor purposes and afterwards for the purpose of electrical locomotion, now perhaps the most important matter before the fraternity. A year ago there were about 4,000 electric stations and isolated plants in operation; now there were 6,067; an increase of 45.8 per cent. It was estimated a year ago that there were 175,000 arc lamps in daily use in the United States. At the present time 219,914 were in use, a gain of 34.3 per cent. The number of incandescent lamps in daily use had increased from 1,750,000 a year to 2,304,490, a gain of 49 per cent. The increase in capitalization in the electric light companies of the United States during the year had been $69,397,734. Comparative figures upon the electric railway industries showed that there were 34 roads in operation six months ago; that the number was now 53, a gain of 19, and that 44 new roads were now under construction. The mileage in operation had been increased during that period from 138 miles of single track to 294½ miles.

Mr. Duncan then referred to the exhibit of electrical supplies and apparatus, saying, "We are gathered at the present time, gentlemen, not only for the purpose of seeing an exhibit of the latest form of electrical supplies, but principally for the purpose of listening to papers and discussions upon all important electrical questions, among them that of petroleum for fuel; materials for underground conduits in relation to the insulating materials of cables; the static charge on underground cables and attendant puncturing thereof; electric light stations as fire risks, and municipal lighting. It seems eminently proper that the information gathered should be presented in this City of Chicago, where the subject of underground electric lighting wires has been more practically carried out than perhaps in any other city in the world.

Benjamin Franklin discovered some facts in regard to electricity over a hundred years ago, and now they are making light of it. So runs the old minstrel joke. They are making "light of it" at the Exposition Building. They are doing many other things with the mysterious fluid which Benjamin Franklin abstracted from the clouds and corked up in a bottle. In fact, it would be easier to enumerate the things they are not doing. A hundred dynamos with flying belts and swift-revolving armatures are generating electricity. Where does it come from? Where does it go to? What is it? Assembled in the convention hall were two hundred men with whom electricity and its applicability is a science, and yet not one of them can answer. They will tell you about "volts," and "amperes," and "ohms," and "internal resistance," "induction," and so on, until your brain reels, but there they stick. What is more, they are not bothering themselves about such questions. They know that such a thing exists, that it is everywhere, that it is powerful. Their mission in life is to gird a harness about the unseen giant which will make him obey the touch of a child. The display now on exhibition is a demonstration of wonderful progress. It is difficult to realize that it has been made substantially within the last ten years. Electric lights had been made years before, but they were not practical. Ten years ago they could not compete with gas on any score. The best that had been produced was a spluttering, flickering arc lamp, dangerous to handle and unsightly to the eye.

What a contrast to the sight that greeted the assembled delegates as they filed into the convention hall! One of the art rooms had been set aside for that purpose, and under the hands of an electrical artist con-

verted into a chamber of dazzling beauty. Suspended from a huge canopy of dark blue material were 280 incandescent lamps, forming a rectangle, in the centre of which is placed a hexagonal star, composed of lamps of various colors artistically blended. The platform is surmounted by a green silk canopy. The silk is caught up in folds, from the edges of which are hung scores of lamps. The initial letters of the association, wrought in electric lamps of many shades, adorn the wall facing the audience. The effect is most pleasing. The room is fairly flooded with light, so soft and steady that the eye is not pained.

The north hall of the Exposition Building is filled with the heavier products of electrical ingenuity. The development of this art has given origin to a hundred new industries, many of which are represented. Extending the entire length of the building is the track of the electric street railway car, illustrating the system now in use at Kansas City and other places. The Thompson-Houston motor is used. The power current is carried on an overhead wire. Connection is made with the motor by means of an arm rising from the roof of the car. This arm terminates with a small, broad flanged friction wheel which runs along the lower surface of the wire, being held firmly in position by a spring. The current thus taken from the wire is also utilized to operate a number of incandescent lights, which can be thrown into circuit any time the wheel is in contact with the wire. It is claimed that a speed of thirty miles an hour can easily be made. The car is under perfect control, the driver having power to reverse the current and the motor by means of a lever, thus stopping the car almost instantly.

CONDENSATION OF POWER.

A large crowd was massed around the Woodward Electric Company's exhibit of storage batteries. Fifty-two cells were ranged on five shelves. Wires extended in all directions, carrying a current which fed fifty or sixty incandescent lamps. In no department has better work been done than in that of storing electricity. It is easy to generate electricity which is used the instant it is created, but it is another thing to put it under lock and key and use a little whenever wanted. Yet the time is coming when a man can carry a hundred horse-power of force in his vest pocket. They have it so now that one hundred horse power is confined in an area less than ten inches square. A battery of that size is now being used to run a street car in Brooklyn. When once charged with electricity it will pull a car and seventy passengers up and down hill for sixty hours. You don't have to feed it. It never gets sick. There is no slot to get stuck in. The cable never frays or slips.

"That innocent looking thing," said Mr. Frank B. Trout, "will pull a street car at an expense of eighty cents a day. When the current is exhausted it takes about five hours to recharge it. I will explain how the batteries are made. We make a mold ten inches square, fill it with coarse salt, which is packed down firmly. The mold and the salt are then baked in an oven. When sufficiently hot a cover is fitted over the top, through a small hole in which molten lead is poured. The lead percolates through the salt to the bottom of the mold, gradually rising to the top. When cooled we have a solid block of lead and salt. This block is then sawed into slabs about a quarter of an inch in thickness. These slabs are immersed in hot water and the salt dissolved, leaving the lead porous. The little holes are then filled with oxide of lead, or red lead as it is more commonly called. The slabs are next put in a weak solution of sulphuric acid, connected with a dynamo, and allowed to remain for seventy hours, at the end of which time the oxide becomes a per-oxide, giving us a positive and negative current. A series of these slabs are then bound together, separated by rubber insulators, and immersed in sulphuric acid. They are then ready to be charged. Any number can be connected, and any required power thus obtained. These batteries will last four years without any attention or repair. We are now filling one order of 60,000 cells for street car motors."

Electric motors with a capacity from one-twentieth of a horse power to ten-horse power were exhibited by the Detroit Motor Company. These delicate and perfect pieces of mechanism were operated by storage batteries. A diminutive motor weighing two pounds was attached to a dentist's drill, driving that instrument of torture at a speed of 2,800 revolutions a minute. Lathes, sewing-machines, and a number of devices requiring small power were in operation. A novel automatic starting switch attracted considerable attention from experts. An electric bell-cord for passenger and freight trains was shown by the Western Electric Company of Chicago. A break in the train is followed by the ringing of bells in the engine, and, if required, every car in the train.

The phonograph is perhaps the most marvelous product of electrical science. Invented as a toy nearly twelve years ago, it now enters the field of usefulness as a competitor with human labor, and promises to work a revolution in certain long-established lines. Gen. Raum had charge of this and exhibited its operation to thousands. The rooms were crowded during the day and packed at night. He explained how the little machine talked, but though an accomplished conversationalist and possessed of a thorough knowledge of the "talking machine," he could not tell how it was done. He would talk into a receiver, work a treadle, and the machine would talk back to those fortunate enough to obtain possession of the little rubber tubes through which the sound passes.

"You see these little hollow paper cylinders," said he, holding up a paper tube six inches long and an inch and a half in diameter. "These cylinders are covered with a preparation of wax. Now, I put these on the machine and fix this needle so that when I talk into the receiver the mica diaphragm vibrates a needle. The cylinder revolves, and the vibrating needle travels slowly across the cylinder, cutting a miniature thread in the wax. There are 140 of these threads to the inch. A microscope would show that the threads are a continuation of minute indentations. We will now try it." He cleared his throat, worked the treadle, and thus addressed his inanimate but responsive auditor, the phonograph-graphophone:

Thomas A. Edison invented the phonograph in 1877—don't crowd there, please. Prof. Bell and Mr. Tainter took up the subject some years ago and produced what is known as the phonograph-graphophone. Ahem, ah,—ah—hem. That is the instrument I am now talking into.

"You will burst the machine with words like that," was the warning advice of a friend. Gen. Raum heeded him not, and poured into the ear of the patient machine this information:

"Both of these instruments record human speech and various other sounds which may be uttered near the instruments, and these sounds are reproduced to the entire satisfaction of all who listen. The tones of the voice, hesitations and all that sort of thing, are reproduced with absolute fidelity. These machines are intended for office use, the dictation of letters, and various other things that are to be transcribed either by an ordinary amanuensis or a type writer. These cylinders can be kept for a great length of time and you can reproduce the speech any number of times—four or five thousand, if you choose.

"That is enough at present," said the General, removing the needle and adjusting a device to which was connected two long rubber tubes terminating in curved gutta percha pieces.

"Hold those in your ears: they won't hurt you," said the General. The reporter did as requested, and held his breath while the General turned the crank. A buzzing sound was followed by a firm, clear voice which declared that "Thomas A. Edison invented the phonograph in 1877." Without a skip or a break the remarks made by the genial manipulator came floating up the tube. The "ahem" was distinct and well-rounded. All day long the machine ground out speeches, at times breaking into music. The phonograph-graphophone is a great machine, and no well-regulated family should be without one.

Among the novelties deserving special mention is a machine for cutting cloth. An electric motor operates a razor-edged knife on the principle of the jig-saw at a speed of 2,200 vibrations a minute. The motor also runs a small incandescent lamp so placed as to throw a light on the work. With this machine a tailor can cut from a pattern fifty thicknesses of cloth at a time. Its operation is perfect, and is an illustration of one of the thousand uses to which electricity can be applied.

The Sperry Electric Light Company had on exhibition a recent invention which will probably cut a figure in the future of mining. The machine operates a huge drill of the usual pattern now minipulated by compressed air. In this invention an electric wire connecting with a powerful motor takes the place of air. It is claimed that much better and more economical results can be obtained by this system.

Two electric light companies displayed samples of electric welding. This process is a comparatively recent discovery and is being rapidly developed. The process is simplicity itself. A specially-wound dynamo is used for this purpose. The two pieces of metal which it is desired to weld are connected with wires carrying the opposite currents. The metallic pieces bear the same relation as the ordinary carbon. When the ends are brought into contact they are instantly melted and fused. Careful calculations have been made and are being made to determine the exact amount of current to properly melt metals of various kinds and diameters. The Thompson & Houston Company showed a three-eighths bar four feet in length which was composed of fifteen

different metals. Electricians expect to be able to unite all kinds of metals by this process, a problem for which a solution has thus far vainly been sought.

SOME COMPOSITIONS.

THERE was a gentle youth fourteen years old, recently imported from Kentucky, who handed in the following as a composition on "Breathing." The instruction was: "Tell all you can about breathing.' He said: "Breath is made of air. We breathe with our lungs, our lights, our liver and kidneys. If it wasn't for our breath we would die when we slept. Our breath keeps the life a-going through the nose when we are asleep. Boys that stay in a room all day should not breathe. They should wait till they get out of doors. Boys in a room make bad, unwholesome air. They make carbonicide. Carbonicide is poisoner than mad dogs. A heap of soldiers was in a bad hole in India, and a Carbonicide got in that there hole and killed nearly every one afore morning. Girls kill the breath with corsits that squeeze the diafram. Girls can't holler or run like boys, because their diafram is squeezed too much. If I was a girl I'd rather be a boy. So I can holler and run and have a big diafram."

The lad who was required to describe "The Cat," touched it up in this fashion: "The house cat is a four-legged quadruped, the legs as usual being at the corners. It is what is sometimes called a tame animal, though it feeds on mice and birds of prey. Its colors are striped, tortus-shell, black, also black and white, and uthers. When it is happy it does not bark, but breathes through its nose instead of its mouth, but I can't remember the name they call the noise. It is a little word but I cant think of it, and it is wrong to copy. Cats also mow, which you have all herd. When you stroke this tame quadruped by drawing your hand along its back, it cocks up its tail like a ruler, so as you can't get no further. Never stroke the hairs acrost, as it makes all cats scrat like mad. Its tail is about too foot long, and its legs about one each. Don't teeze cats, for firstly it is wrong so to do, and, second, cats have clawses which is longer than people think. Cats have nine liveses, but which is seldom required in this country, cause of Christianity. Men cats are allus called Tom and girls cats Puss; but, queer as you may think, all little cats are called kittens, which is a wrong name which oughter be changed. This tame quadruped can see in the dark, so rats stand no chants, much less mice. Girls fear rats, even mice. Last Tewsday I drawed our cat on some white tea paper, and I sold it to a boy who has a father for 20 pins and some coff drops. Cats are very useful. I can't remember one of the noises they make, though I've just been trying again. Cats eat meat and most anythink, speshully where you cant afford. This is all about cats."—*Longman's Magazine.*

Another natural history subject was "The Dog," and it was announced that extra marks would be given to those who introduced into their essays a couplet on that animal. This, as may be supposed, proved an insurmountable obstacle to most; but one of the boys got over the difficulty in this manner: "The dog is a noble animal, being of several kinds, such as Newfoundland, collie, pup, mastiff and mongrel. It is called the friend of man, because on the Alps they carry bottles round their necks to save the lives of travelers who are lost in the snow. Also the friend of women, like the poetry which says:

'Old Mother Hubbard, she went to the cupboard,
To give her poor dog a bone,'

but she hadn't any. The dog has usually a hairy coat, though some haven't, like hounds and such. Hairy ones are best for watching."

All the boys at a certain school being ordered to compete for a prize offered for the best composition, one of them named John refused to do it on the ground that he could think of nothing to write about. Nevertheless he was obliged to compete, and when the day of trial came he was asked in turn to read his essay. He began.

"My composition is about Spring. Spring will soon be here, How do I know that? Because it came last year, and the year before that, and the year before that.

"The grass will soon grow green, and the trees will put forth leaves. How do I know that? Because the grass grew green and the trees put forth leaves last year and, the year before that, and the year before that.

"And the lambs will come, and they will gambol and play and have a good time. How do I know that? Because the lambs gamboled last year and the year before that, and the year before that. And——"

Here the reader was interrupted by his teacher, who, tired of the iteration, told

him that he need read no more, and John triumphantly returned to his seat amid the laughter of the audience. Needless to say, however, his composition did not gain the coveted prize.

RURAL IMPROVEMENT SOCIETIES.

BY CHARLES F. WINGATE.

THERE are in the United States Postal Directory 47,000 addresses, each representing a community of householders more or less large. There are 2,000 towns having 5,000 inhabitants or upwards, and 900 places with a public water supply, and 200 with a system of sewers.

In each of these localities, whether large or small, the problem of public health and rural improvement demands attention. Wherever human beings congregate, even amid the most perfect natural conditions, contamination of soil, air, and water will surely follow unless proper precautions are used. The waste products of domestic life —ashes, garbage, kitchen slops and sewage —must be got rid of. The ground must be kept free from damp or pollution, while unsightly and unwholesome objects will inevitably accumulate. Roads and walks will have to be laid out, fences built, grounds improved, and a host of things done both as matters of convenience and necessity. In many hundreds of places these measures have not all been taken, nor has the work of adornment been even attempted. In others it has been entrusted to local officials who feel no special interest in such service, and who lack the knowledge how to perform it properly. In consequence, in all parts of the Union towns and villages abound which are neither beautiful nor healthful. There is either too much or too little shade. The roads are dust heaps or pools of mud and water, stagnant ponds abound, vacant lots are used as dumping places for refuse, the surroundings of railway stations, churches, school houses are bare and unsightly, while pig pens, cess pools and privies are found close to dwellings, creating an eye sore and threatening the public health.

Time only heightens the bad effects of these conditions, which prepare the way for epidemic outbreaks. At the same time they seriously retard the prosperity of the neighborhood. There is nothing to invite strangers to visit such places or to lead residents to remain in them. Localities which have been famed for their salubrity begin to have a bad reputation for chills and malaria. Typhoid fever is found everywhere amid such conditions, while diphtheria and scarlet fever are constant visitors. In short, country places, which ought to be more healthful than cities, are in reality less so, and their superior natural advantages are neutralized by human neglect and folly.

These facts have steadily grown upon public attention. State and national health officials have labored earnestly to rouse the public to the necessity of reformatory action, and with good results in the main. Finally, within a few years local organizations of citizen householders have been formed to deal with the problem of health and adornment, and they are now being multiplied in all parts of the country. The first experiment of this kind was made at Stockbridge, Mass., by the formation of "The Laurel Hill Association," through the efforts of Mrs. Goodrich. The fame of this undertaking spread far and wide, and other societies were gradually founded on the same plan. Through the efforts of B. G. Northrop, of Clinton, Conn., N. H. Eggleston, of Williamstown, Mass., and other gentlemen, this missionary work has extended through all parts of the country. The former gentleman has lectured on rural improvement throughout New England and in the West and South, and as a result of his efforts some 200 societies have been formed, while he is devoting his whole time to this work. Mr. Northrop says of his motives in carrying on this noble service: "My prime aim in this work has been to ennoble the home life of the people and help them to realize that the highest privilege of life is the creation of a happy home, for here is the chief school of virtue, the fountain head of individual and national strength and prosperity." The same sentiment was constantly repeated by Mr. A. J. Downing, who is justly considered the father of landscape architecture in this country. Most of these associations are to be found in New England and mainly in Massachusetts and Connecticut, but they are also numerous in New Jersey, New York, Michigan, Illinois, Wisconsin and Western Virginia.

Rural Improvement Societies are mostly in small communities, while the Sanitary Associations are found in large cities as well. In the early stages of the movement the largest share of attention among the members of these societies was given to rural adornment. Where the population was small and scattered, drainage arrangements were simple and the problem of

health did not demand serious attention. Lamps were put up, trees planted, streets paved, sidewalks laid, water troughs and fountains erected, roads repaired and sprinkled, fences removed so that property divisions were not apparent, and a park-like appearance was thus given to grounds which previously had seemed too cramped and confined. The surroundings of schools and depots were beautified, the cemetery was adorned in various ways, and everything that could offend the eye or senses was removed. Gradually, however, as population increased and houses thickened, cess-pools and other nuisance-breeding evils multiplied, and questions of health have become prominent, and people are now most interested in securing proper sewerage, plumbing, heating and ventilation. At the same time registration of deaths has become a necessity, with precautions against the spread of contagious diseases. In short, as civilization has become more complex, the householder finds that he cannot deal as an individual with conditions affecting his health and that of his family, but must join with his neighbors to protect the public weal.

In their plans of action these societies suggest the methods of the old New England Town Meetings, with the exception that they possess no legal powers, and that there is no obligation for any citizen or householder to join them, but that they appeal to the enlightened self interest of the community, and depend for their influence upon the press and other means of agitation to secure their ends.

The work which these societies have undertaken is one which specially interests women, and which they are specially suited to carry on. They have the leisure to attend to it and the taste and instinct demanded for its success. There are many Town Improvement Societies composed entirely of ladies, and those in which they are not active sharers are the exception. While most of the literature of landscape gardening has been written by men, yet women naturally take most interest in rural adornment. They are also natural sanitary reformers. Their public services in this capacity are incalculable. One has only to mention the names of Florence Nightingale, Miss Dix, Clara Barton, Drs. Emily and Elizabeth Blackwell, Miss Garrett, "Sister Dora," Louisa Lee Schuyler, Mrs. Lowell, Miss Ellen Collins and a host of allies of the Sanitary Commission, to prove women's capacity for public work in the field of hygiene. At the same time no woman can be a housekeeper or mother without needing to know the essentials of sanitation. In my own experience I have always found the women of the household to be most interested in questions of drainage, and they display much more aptitude than men for understanding such matters.

I will conclude the present article by giving a draft of a constitution for a Rural Improvement Society, prepared by Mr. Northrop, which may be taken as a model. The conditions of membership may properly vary with the wealth and liberality of each community. Some associations fix the terms of membership at one, two, three and even five dollars *annually*, while others make them low enough to invite the co operation of all classes.

1. This Association shall be called "The Rural Improvement Association of —— ——."

2. The object of this Association shall be to cultivate public spirit, promote good fellowship, quicken the intellectual life of the people, secure public health by better conditions in our homes and surroundings, improve our streets, roads, roadsides, sidewalks, public pounds, protect natural scenery, remove nuisances, provide drinking troughs, break out paths through the snow, and in general to build up and beautify the whole town, and so enhance the value of its property and render it a still more inviting place of residence.

3. The officers of this Association shall consist of a President, a Vice-President, a Treasurer, a Secretary, and an Executive Committee, half of whom shall be ladies.

4. It shall be the duty of the Executive Committee to make all contracts, employ all laborers, expend all money, and superintend all improvements made by the Association. They shall hold meetings monthly from April to October in each year, and as much oftener as they may deem expedient.

5. Every person who shall plant three trees by the road-side, under the direction of the Executive Committee, or pay three dollars in one year or one dollar annually, and obligate himself or herself to pay the same annually for three years, shall be a member of this Association.

6. The payment of ten dollars annually for three years, or of twenty-five dollars in one sum, constitute one a life member of this Association.

7. Five members of the Executive Committee present at any meeting shall constitute a quorum.

8. No debt shall be contracted by the Executive Committee beyond the amount of available means within their control, and no member of the Association shall be liable for any debt of the Association beyond the amount of his or her subscription.

9. The Executive Committee shall call an annual meeting, giving due notice of the same, for the election of officers of this Association,

and at said meeting shall make a detailed report of all moneys received and expended during the year, the number of trees planted under their direction and the number planted by individuals, length of sidewalks made or repaired, and the doings of the Committee in general.

10. This Constitution may be amended at any annual meeting by a two-thirds vote of the members present and voting.—*The Countryside.*

SOMETHING ABOUT A TREE.

A TREE (and I beg my reader to follow this attempt at explanation closely—all depends upon it) receives its nourishment from the roots. These correspond to the mouth in the human frame. Now, as in the human frame the nourishment received is, after being supplied to the blood, exposed to the operation of air in the lungs before it is fit to give material to the body, so in a tree, the nourishment taken in at these tree mouths, the roots, passes to the lungs of the tree, and there by contact with the air is rendered fit to supply fresh material to the tree. These tree lungs are the leaves. This operation is effected by the passage upward from the soil around the roots, through the trunk, the branches, and every twig of the tree to the leaves, of a large quantity of water, containing in solution the nutriment for the tree. Arrived at the leaves, a process takes place which separates, by means of contact with the air, most of the water the roots have taken in, from the valuable nutriment, and throws off, in vapor, the surplus water into the air. At this time certain constituent portions of the air are utilized and mingled with the nourishment retained. This is all, now a small portion in comparison with what had arisen from the roots, yet retaining enough water to serve as a vehicle back, is returned toward the roots, depositing in its way, in leaf, bark, and root, what is needed there for the growth of the tree. In these, they undergo, especially in the bark, further fitting and digesting processes before they assimilate with the substance of the tree. The water which was retained to carry them down, being no longer needed, passes out at the roots. In the back of the leaf are numerous stomates or mouths. Of the extent of the provision made for evaporation by the leaves, some idea may be formed from a consideration of the number of *stomata* or stomates to be found in the leaves of plants. The number varies in different plants, for which variation a reason may be found in the different conditions of growth to which they are subjected in their several natural habits. In the back of the leaf of the apple tree there are about twenty-four thousand stomates to the square inch. In the leaf of the lilac there are a hundred and sixty thousand of them to the square inch. In the leaves of the cherry-laurel there are none on the upper surface of the leaf, but ninety thousand have been counted on the lower surface.

STATISTICS AND PROFITS OF ARBOR DAY.

BY R. F. DIEFFENDERFER.

IF every farmer in Lancaster county plants but two trees on Arbor Day, the aggregate will cover about 240 acres. If every pupil in the public schools of the county plants only one tree, 300 more acres will be covered. There are enough owners of town lots and small country homes to swell the aggregate to as many as 640 acres. That means a square mile set out in fruit trees in a single year in this one county alone. These trees, set out as they are in many thousands of places, make very little show, and such a tree-planting movement may consequently seem a very unimportant thing; but whether planted separately or together matters very little, as the ultimate result will be nearly the same. If any one thinks such a proceeding is an idle one and destitute of results, let him calculate the amount of fruit which such a vast number of trees will produce in a few years. The above estimate calls for about 48,000 trees. As many of these would be early-bearing fruit trees, such as peach, plum, apricot and the like, in three or four years they would begin to repay their owners with abundant crops. Pear trees would require a few years more and apple trees still longer. By the time the peach trees were exhausted, the apple and pear trees would be in full bearing, and will continue so from thirty to fifty years, and some even longer.

Even careful readers, when they carry out this idea to its ultimate results, will be surprised at the astonishing figures that the products of these trees would present when carefully analyzed. A good peach tree at the age of four years ought to yield a fair crop of fruit, and abundant crops for at least four years longer. Two dollars per season would be a very low estimate of the value of the crop. A pear tree ought to remain productive almost a lifetime. Four dollars per tree, for a period of twenty-five

years, is entirely within the limits of actual experience. If we calculate the life of an apple tree at thirty years, we may safely calculate ten full crop seasons, worth five dollars per tree. Now we have the basis of a little calculation. Suppose that we estimate the above number of trees to be divided into the following classes, we get this result:

18,000 peach trees at $12	$ 216,000
18,000 apple trees at $50	900,000
5,000 pear trees at $100	500,000
7,000 shade trees	
	$1,616,000

This would give us nearly two millions of dollars as the actual income from the trees planted on a single Arbor Day in a single county. All who are acquainted by long experience with the productiveness of fruit trees know that these figures, instead of being in any way exaggerated, are in reality far short of the actual results that have been and can be realized from fruit trees. In the foregoing calculation, no account is taken of the value of the wood when the bearing period of these trees is over. It ought to be sufficient to pay for the care of the trees while in their prime. Professional fruit growers could no doubt point to far larger profits than any we have set down.

We have made the above estimates to show that those who plant fruit and other trees are not only doing a service to mankind, but are getting handsomely paid for their pleasant and inexpensive labor. To no class of men does Arbor Day appeal so strongly as to farmers. Two choice-bearing apple or pear trees will bring them as much net income as an acre of ground planted in wheat or oats, or almost any other ordinary farm crop. They do this, too, without much care, require little labor, and interfere very little with the growth of other crops. Neither have we taken into account the infinite satisfaction and pleasure which every one who is not wooden-souled must derive from seeing his trees growing and expanding into fruitfulness, and the gratification he must feel in eating the fruit. For all this there can be no money compensation. It is altogether beyond pecuniary reward. In short, Arbor Day opens up the way to every one who has a square rood of land, to do good and get paid for it.—*Lancaster New Era.*

The one crowning qualification of the perfect teacher is sympathy—sympathy with young children, with their wants and their ways; without this, all other qualifications fail to achieve highest results.—***Fitch.***

STATE SCHOOL-BOOK LEGISLATION.

A CRISIS has been reached in the condition of the public mind in a few western states, concerning the publication of school-books. There will be, hereafter, a better understanding, a more healthy condition of public sentiment. With the origin of the agitation we have nothing to do. Suffice it to say that the buoyancy of spirit and temper of criticism that have characterized a half-dozen rapidly-exploded and early-forgotten agitations directed itself to the publication of school-books with rare fury. It was useless for any one to protest or express an opinion. Nothing less than an "official investigation," full and genuine, would answer the case. It was fortunate, therefore, that the Legislative Commission recently appointed by the Senate and House of Ohio to investigate "Trusts," visited Cincinnati for the purpose of summoning a large number of witnesses, publishers, booksellers, agents, and others, who were examined under oath as to the alleged "School-Book Trust." Full reports of the testimony were published in the city papers. As this is more than a local issue, and as it is the first official utterance upon a matter regarding which there has been much heedless talk, we give the result in detail:

It was proved by the sworn testimony that there is not now, and never has been, any "school-book trust," nor any "pooling of issues," or anything else in the nature of a trust, or any arrangement to lessen competition in prices. But that there is, however, a "School-Book Publishers' Association," organized and sustained solely for the purpose of bringing the business of introducing books under wholesome regulations and proper restrictions, having reference only to the operations of traveling agents, and resulting in the best interests of the public.

It was proved that there is not now, and has never been, any combination among publishers for the purpose of maintaining or "keeping up," or in any manner controlling, or tending to control the prices; but on the contrary its avowed object is to "cheapen the price of school-books," and that such has been the result, every house, member of the association, being free to make their prices and terms as low as they please, change them as often as they please, reduce them as much as they please, and sell their books as cheaply as they can afford.

It was proved that there is not now, and never has been, as alleged, a division of ter-

ritory among publishers, such as assigning one state, or a portion of a state, to one firm, and another to another; but that on the contrary all publishers are at perfect liberty to compete for the patronage in any state or county where competition is not prohibited by law, and that the only reason why the publications of certain houses are more largely used in one section of the country, while those of other houses are more largely used in other sections, is the natural result of choice in selection, local preference, and the natural desire for uniformity.

It was proved that there is not now, and never has been, as alleged, any such thing as "school-book monopoly" in any state, county, or territory, except where such "monopoly" has been forced upon communities by unwholesome laws creating such monopoly; but that on the contrary, with these exceptions, every state, county, and city is open alike to the competition of all school-book publishers whenever they desire to submit their publications upon their merits, together with their most liberal terms. Boards of education are at liberty at all times, and have the privilege of selecting, according to their own choice, from all the great number of series published, and can be supplied at the very lowest exchange, introduction, wholesale or contract prices, and upon the most favorable terms afforded to any state, county, or city.

It was proved that since the organization of the "School-Book Publishers' Association" the evils resulting from the sharp competition among rival publishers, such as strife and disagreement among boards of education and factions in communities, have been almost entirely obviated, and at the same time the prices of school-books materially reduced. For instance, that the retail prices of school-books have in most places been lessened fully twenty per cent., and where they are sold at the publishers' net contract prices, from thirty-three and one-third to forty per cent., and that these contract prices are lower than the prices of any books published by State appropriation at the expense of tax-payers.

This will do much toward calling a halt in the injudicious attempts of legislatures to set up a book-publishing establishment of their own, supplying, at public expense, that which private enterprise has done much better and at lower rates. The educational sentiment, so far as we know it, is most decidedly opposed to any step backward in educational progress, such as seems inevitable under the machine-like way of making text-books by the State. It is not out of regard to the publishers, great as has been their service to the cause of education by their alertness in embodying in text-book form every advance in methods of instructions, every latest fact in science, history, nature, and philosophy, but out of regard to the cause of education, which means the best good of the country in every respect. It would be practically impossible for any man to do as good, independent, progressive work for the State seeking economy through monopoly, as for a publishing house pushed to the utmost generosity by competition.

The American school-book is recognized throughout the world as a model of good taste and beauty, because competition has led publishers to command the highest skill and the best thought, not of one state or county, but of the world.

The educational influence of these text-books is felt in every home into which they enter. For these reasons we hold that the school publishers should be considered as essential auxiliaries in the promotion of the highest usefulness of the public schools, and while they engage in their work from a business standpoint, they deserve to be regarded as helpers in the advancement of education and to be treated like other honorable business men. *N. E. Journal of Education.*

PRESERVE THE FORESTS.

THE necessity of preserving the forests of America is forcibly urged in a very able article on the subject which appeared in the Philadelphia *Record*, which says that "in spite of all that has been said and written on the subject, the depletion of the forests continues, leading to grave fears that before long there will be a serious diminution in the supply of one material on which the growth of our industries largely depends, and which plays so important a part in regulating water supply and soil conditions."

The *Record* adds: "It is true that some people believe that man may yet make use of aluminium as a substitute for wood, and that in some cases substitutes are already employed; but in spite of this the present forest area of the country, which as reported is less than 500,000,000 acres, cannot in its existing condition and under present methods of utilization furnish a continuous supply of wood of all kinds even to our present population of 60,000,000, the annual consumption being over twenty

billion cubic feet. If, therefore, the present rate of destruction of our supply of building material shall continue, it will be practically exhausted before any new crop now started can be ready for use. In spite of the employment of substitutes, the consumption of wood is increasing with the increase of population all over the world. In Germany the consumption of coal has increased 265 per cent. within twenty-four years, and yet the wood consumption has increased in a similar ratio. In that country, however, while whole forests may be cleared at once, the laws require that before each clearing shall have been effected a similar area shall be freshly planted.

"Economy in the uses of wood, careful protection and working of the natural forests, and planting of new forests on waste places and in the prairie region, have become a necessity in this country. To subject abrupt declivities to the plow instead of retaining them in timber or grass causes greater erosive action of rain, and wherever forests have been cleared away there has been a sudden precipitation of the rainfall into the streams, which has brought about serious inundations. The removal of forests also causes the loss of the secondary rainfall, which arises from the evaporation of the moisture retained by the spongy bed and brimming streams of the primeval woods. In every part of the country we need a systematic control of our remaining timbered district; and if men have the right to lay them waste as they please, it is time that laws granting such privileges should be repealed."

THE CONSTELLATIONS.

BY GEORGE S. JONES.

AMONG the curious things bequeathed to us by antiquity none is more curious than that celestial menagerie known as the constellations. No one who has ever strained his eyes and taxed his imagination in the effort to trace among the stars their outlines, as they are delineated upon a celestial chart, needs be told that there is nothing like them in the actual heavens. Upon the chart we find, spread in bewildering confusion, heroes and heroines of mythology, beasts, birds, dragons, centaurs; but when we seek them, or at least some faint likeness of them, in the real heavens, we find stars only, in some cases, it is true, forming noticeable groups, but which without this heritage of ancient astronomical observation we should as little think of arranging into the likeness of terrestrial creatures as we should of shaping, like Hamlet, such figures among the clouds. Indeed, these figures are now discarded even by the chart-maker. Astronomers still divide the heavens into constellations, as a convenient though somewhat cumbersome system of star nomenclature; but the astronomical constellations are simply star regions of irregular shape, laid down upon the chart as the political divisions of a continent are laid down on a terrestrial map.

Curious as this system of constellations is, it is not without its explanation. We may be sure that its origin was exceedingly simple; we have no warrant for assuming that our ancestors in the remote past were more sharp-sighted or imaginative than we, or that they were impressed more deeply by the beauty of the star-bespangled heavens. Yet, unquestionably they were more given to star-gazing than are we. The truth is that we have here a case in which the progress of the useful arts has left upon our hands such strange lumber that we are apt to overlook its former utility in view of its quaintness, and often thoughtlessly put our ancestors down for a very queer people.

Virgil lets us into this mystery of the constellations and gives us one of the clues we seek, when, speaking of the close of the golden and the beginning of the iron age, and enumerating the hardships which the change imposed upon mankind, he says: "Then sailors observed the order and gave names to the stars, the Pleiades, the Hyades and the Bear, the famed daughter of Lycaon." Sailors observed and named the stars, not to while away the idle moments of their night watches, but because a knowledge of them was necessary in their occupation. The stars were for them a convenient and, indeed, the only means of directing their course by night. But besides this well-known use which sailors made of the stars, there was another use made of them, the importance of which we, with our Julian year and our perfected calendar, can hardly appreciate, and which we are very apt, in considering this subject, to leave altogether out of sight. There was in those early days no other way of determining with certainty the important periods of the year —the time when it was safe to venture on the sea and the time when navigation must be suspended—than by observing the changing aspect of the heavens. A practical knowledge of the stars and constellations

was imposed upon the sailor by necessity; he had no other calendar. And this knowledge was indispensable to the husbandman, as well as to the sailor. Thus, to quote from Virgil again, the farmer plants his beans and sows his millet, not on a certain day of a certain day of a certain month, duly indicated in the almanac, but "when Taurus opens the year with his golden horns and the Dog Star sets in the opposite quarter of the heavens"—that is, when the constellation Taurus rises just at daybreak, which would be some time in April. But if barley and far (wheat) are to be sown, the rule is: "Let the Pleiades be hidden (in the west) and the Gnossian Crown set before the seed is committed to the furrow."

In this every-day use of the stars by the ancients is to be found, unquestionably, the beginning of this system of constellations which in process of time developed into the most perplexing and apparently the most senseless of mythological riddles. A thing that is used and has, therefore, to be spoken of, must have a name; and as soon as it was discovered that the stars could be put to use, their naming followed as a logical necessity. Naturally men selected as their marking points for noting the revolution of the starry sphere the most remarkable stars or groups of stars, and the naming of these was the first step in practical astronomy. We need not suppose, nor is it, indeed, probable, that they began by giving them the names of mythological heroes, or of the animals which they were fancied to resemble. On the contrary it may be presumed, and what little evidence can be attained through the science of language supports this presumption, that the names first given to the stars had no sort of mythological taint, but were sensible and commonplace. The mythology of the constellations was an after-growth, arising often through a misinterpretation of names of which the true meaning or significance had been lost. To illustrate by one or two instances. Upon the first appearance of the star Sirius in the morning the inundation of the Nile began. Sirius was, therefore, an important star to the Egyptian husbandman. It gave him warning of the approach of an occurrence in which he had great interests at stake, and he called it, therefore, the Watcher, the Dog, Anubis. Hence we get our Dog Star. Upon the chart we find in connection with Sirius the picture of a dog, but it is of course idle to look for the outlines of this animal in any peculiar configuration of the stars in this region. A little in advance of Sirius on the celestial sphere, rising a few days before it and giving notice of its approach, is another first magnitude star to which the Greeks gave the name Pro-cyon, *i. e.*, Before-dog. This gives us our Little Dog (Canis Minor) on the celestial chart. To the northwest of Procyon may be seen a pair of stars of the second magnitude, about five degrees apart. They are noticeable objects, and they were for the ancients one excellent marking-point in their observation of the heavens. It is easy to understand, as we look at them, why they were called The Twins. But there was in the Greek mythology another pair of twins, the heroes of legend, known as Castor and Pollux. The origin of this myth of the twin demi-gods we need not enter upon here; it is enough to say that these personages had originally no connection with the stars. But in those days, when mythology was in its full vigor, the two sets of twins—the sideral and the mythological—became almost inevitably confounded, and the twin stars came in time to be known as Castor and Pollux. These names are still given to them on our celestial charts, and we may find there also an appropriate delineation of the constellation, embracing other stars in their neighborhood. It is needless to add that these figures of the twins are drawn with as little reference to the stars as are those of the two dogs.

There is another constellation which has been the cause of endless perplexity—the Ursa Major, or Great Bear. Who has not wondered while endeavoring to trace the outlines of this constellation, what the ancients saw in this group of stars suggestive of that animal? A chariot, a plow, a dipper—any one of these designations suits it well enough; but a bear it certainly is not, if for no other reason because the bear, at least the modern bear, has no tail, and yet in the constellation the tail is about the only part that we can be certain of making out. Professor Max Muller has suggested an explanation of this constellation, which, if not quite convincing, is at least very plausible. He tells us that it is not surprising that we have had so poor success in our search for this monster bear in the skies, for there is none there and never has been. It is all a mistake, and his account of the origin of the mistake is in substance this:

This constellation, or rather that portion of it which forms the Dipper, or as the English prefer to call it, the Plow, appears to have been known to the early Aryans as the *Seven Rikshas*. This word *riksha*, Profes-

sor Muller tells us, means *bright one*, and was applied originally to the stars in general. The seven *rikshas* meant originally nothing more than the seven *stars*. But other words for star were also used in those early times, and after a while the word *riksha* ceased to be used except in reference to the seven remarkable stars in the north. Let us see what happened. The Hindoos who had received this name, *Seven Rikshas*, from their ancestors, and knew nothing of its original meaning, confounded it with another word, *rishi*, which meant *poet;* and so these stars came finally to be called by them the *Seven Rishis* or Seven Poets. These seven Rishis fill a large place in the Hindoo mythology, and a story was of course told explaining how they got their place among the stars. So much for the Hindoo branch of this myth; and now let us see what the Greeks did. They seem to have been equally unfortunate with the word *riksha;* they, too, lost its meaning; but they had a word which sounded very much like it which meant *bear*. This word was *arktos*, which students of language assure us is the same word as *riksha*, or *arksha*, in a Greek dress. The Greeks seem, therefore, to have mistaken the seven *rikshas* for bears, just as the Hindoos had mistaken them for poets, both being misled by an erroneous interpretation of a name.

EDITORIAL DEPARTMENT.

THE SCHOOL JOURNAL.

LANCASTER, APRIL, 1889.

E. E. HIGBEE. . . . . J. P. McCASKEY

"Ye may be aye stickin' in a tree, Jock; it will
be growin' when ye're sleepin'." *Scotch Farmer*

ARBOR DAY PROCLAMATION.

In the name and by the authority of the Commonwealth of Pennsylvania,

A PROCLAMATION.

The brightening branches and swelling buds of our early deciduous trees warn us of the duty and the privilege of repairing the wastes of the present and providing for the wants of the future. The people of the Commonwealth have been in advance of the Executive in the thought of and preparation for our annual Arbor Day. It is pleasant thus to note the interest which has been and is being awakened upon this subject.

By the concurrent resolution of the Legislature approved the 30th day of March, 1887, the Governor is requested to appoint, annually, a day to be designated as Arbor Day in Pennsylvania, and to recommend by proclamation to the people, on the days named, the planting of trees and shrubbery in the public school grounds and along our public highways throughout the State.

This request is most cheerfully complied with, and in accordance therewith,

FRIDAY, APRIL 26th, 1889,

is hereby designated and set apart as Arbor Day in Pennsylvania.

The planting of trees and shrubbery in our public school grounds and along our highways is earnestly recommended to our people. The subject of tree planting, however, has become so important in many ways that the Executive feels compelled to give wider scope, if possible, to the observance of Arbor Day than is hereinbefore indicated. Public parks are being provided for in several of our cities and towns, through private munificence and public enterprise. In what way can the individual citizen of these several cities and towns better show his appreciation of and graitude for these benefactions than by planting a tree, which shall not only manifest his appreciation, but at the same time deepen the interest of himself and his family in a work which is so essentially for the public good? What better rallying point for the family in a public park than the tree of their own planting and nurture? What more beautiful tribute to the men who have so nobly provided for the health and happiness of future generations than such a mark of grateful appreciation on the part of the people of the several communities benefited? The places for such tree planting could be designated by the authorities in charge, and the results could not but be in many ways beneficial.

We have for several years been devoting our energies in many parts of the State to beautifying the grounds about our school buildings; let us give special heed in our coming Arbor Day to beautifying our highways, both in town and country. Let us become a tree-planting Commonwealth. Let us plant trees which will grow into value and be useful for the wood supply of the coming generation. The discouragements which have beset those who were interested in this subject heretofore in Pennsylvania are being gradually removed. The encouragements are slowly multiplying. Whilst we teach the children, and hold pleasant converse in the school room over the beauty and usefulness of tree and shrub, let us give them practical leslons in the actual planting, which shall awaken their desire and determination to do likewise.

Would that our people could be impressed with the importance of this subject! Would that we could realize the great debt of obligation which we owe to the coming generations! We have drawn upon the century which has passed,

have denuded our forests, have wasted our precious heritage, and seem to have little realization of the obligation which rests upon us to repair these wastes and to restore this heritage.

It may not be out of place for the Executive in this proclamation to carry the thought of our people beyond the school-grounds and parks and highways, and commend to all who are the owners of land, which can be re-forested, the importance—yea, the necessity—of turning their attention to forestry as a means of profit to themselves and of incalculable benefit to the community in general.

Let our thoughts turn at once to preparation for the coming Arbor Day. Let trees be provided in advance. Let the citizens of our several communites consult together as to the species of trees suited to each locality likely to grow into what will be useful as well as ornamental. Let preliminary meetings be held to arrange for the details of the observance of Arbor Day, and let our roadsides welcome with smiling verdure the era of better roadways, which, we hope, is dawning in Pennsylvania.

In testimony whereof, I have hereunto set my hand and caused the Great Seal of the State to be affixed, this third day of April, in the year of our Lord one thousand eight hundred and eighty-nine, and of the Commonwealth the one hundred and thirteenth.

JAMES A. BEAVER.

By the Governor:
CHARLES W. STONE,
Secretary of the Commonwealth.

BE sure to plant a Washington tree this year, to commemorate the centennial of the inauguration of the Father of his Country. If a "Washington elm," all the better. Nothing could be more appropriate, nor any tree of greater local interest, as the years pass, than such centennial tree well chosen, well planted, and well cared for during the next twenty-five or fifty years.

A bill to establish a National University for the education of teachers was introduced into the United States Senate by Senator Stewart, of Nevada, some time since, and referred to the Committee on Education and Labor. Its provisions were that tuition, rooms, board, lodging, text-books and stationery should be furnished the students free of charge; that the course should be four years; the President annually to appoint fifty students; each Senator, representative, and delegate to Congress to appoint from his district one student each year, the appointment to be made one year before admission. One million of dollars was asked to accomplish this. It would seem a good direction in which to expend a part of the national surplus, better than either West Point or Annapolis. The United States must be an educated nation, and a great National University at the national capital would make its influence felt for good in every part of the country.

ARBOR DAY is coming—and the Springtime, with its wealth of green and its wonder of foliage, as if the Earth had broken from an enchanted sleep at the touch of the storied Princess' magic feather. The mighty power of Life is manifesting itself on every hand in the dawning glory of the fields and woods. It stands ready also to work for *us*, and *at our will*, if we but sow and plant and tend with care. Let us heed aright the challenge of Arbor Day, which should perhaps be more generally regarded than any other day of special observance set apart by law—because of the result it leaves in making richer all after-years!

THE Statue of Liberty Enlightening the World, a gift from the people of the Republic of France to the people of the United States, commemorates the alliance of the two nations in achieving the Independence of the United States of America, and attests their abiding friendship. Strangers visiting New York should not fail to see this wonderful colossal work of art on Bedloe's Island. The steamboat leaves Government Dock, Battery, (terminus of all elevated railroads) daily, every hour from 9 a. m. to 5 p. m. Fare for round trip, 25 cents. The proceeds are devoted to the completion of the arches and stairways of the statue.

THE Lititz *Record* has the following paragraph, among others referring to Prof. Beck, which shows the originator of the Lancasterian system of schools to have been less generous than was anticipated. If it be true, such lack of common decency, to say nothing of generosity, merits only the fate that befell the system of Joseph Lancaster, that of failure. Says the *Record:*

Mr. Beck was constantly in search of new ideas of instruction, and visited others to improve his own school. But he often found himself an unwelcome visitor. The present era of sociability and free exchange of thoughts and opinions had not then been inaugurated. In the year 1820 the celebrated teacher, Joseph Lancaster, came to this country from England in order to introduce his method, whereby he professed to instruct seven hundred children in a body in all the various branches of education. Mr. Beck's desire to see him and his school was so great that he at once started for Baltimore, where Mr. Lancaster was teaching at that time. He arrived in the evening, and the next morn-

ing hastened to the school as early as he thought proper. He encountered him at the door, and after shaking hands with Mr. L. introduced himself as a teacher, stating to him the object of his visit. The reply was: "I am sorry for thee: I am not in the habit of admitting teachers into my school." Mr. Beck tried to reason with him, telling him that he had heard and read much about him, had traveled a hundred miles to see him, and that probably he might make an exception in his case, yet all to no purpose, for he repeated once more, "I am sorry for thee," turned his back upon him, and left him standing there upon the steps.

THE late Henry Ward Beecher was an ardent lover of nature, and a tree-planter of discretion and large experience. Two years ago we visited "Boscobel," his beautiful country residence near Peekskill on the Hudson, which was the especial pride of the great clergyman's later years. He built the fine Gothic mansion here mainly from the proceeds of a lecture tour, and he used to speak of it humorously as "his castle of wind." The place contains over 6000 trees of almost every variety, many of them planted by Mr. Beecher himself, besides over 2000 fruit-bearing vines and plants. Altogether Mr. Beecher expended upwards of $200,000 on this place. The mansion alone cost $70,000, and the collection of trees and plants is, with the exception of that of the Smithsonian Institution, the finest in this country. Here was a tree-planter of account, worthy of Arbor Day mention.

"MIKE," said a priest to a thriving parishioner, who, without being a student of philosophy or history, used his perceptive faculties, prospered by his wits, and had become a considerable person in the parish, "I don't see your children at the parish school any more." "And because they don't go there any more, your riverence," answered Mike. "But do you mean to let your boys and girls grow up without an education, then?" "Not a bit of it, your riverence." "How is that, Mike?" "O they go to the public school; it costs less, they learn as fast, and they grow up along with them that they are to deal with." "Ah, Mike, but that will never do. You *must* send them to the parish school." Mike's manner changed from grave to gay. Looking his shepherd in the eye, with a self-possessed smile, he continued the dialogue. "Father, you and I came over the water a few years ago, didn't we?" "Why, yes, Mike; but what if we did?" "Well, Father, when you and I came over the water we left 'must' behind us."

OUR SPRING ARBOR DAY.

THE Arbor Day proclamation of Governor Beaver, which is found in another column—for insertion of which the present issue of the *Journal* has been delayed—names Friday, April 26th, as the day for special observance in Pennsylvania of the pleasant duty of tree-planting. It is the proclamation, not only of the Governor of Pennsylvania, whose personal interest in this direction is so well known, but also of the President of our National Forestry Association, to which honorable position Governor Beaver was chosen at its late meeting at Atlanta, Georgia, in recognition of his helpful aid in this new and important movement. The State should heed this earnest call to duty by the planting of at least a hundred thousand trees, with tens of thousands of shrubs and vines, ornamental and useful, of every kind.

Wherever the schools are in session, let everything be done by the teachers and pupils, with the approval and encouragement of Superintendents, Directors, and patrons generally, to make the day memorable, both for its pleasant associations and for the lasting benefits that are designed to follow upon its proper observance. Let planting be done both at home and on the school grounds. A part of the day should be given to appropriate musical and literary exercises, but this should not be all that is done; it is essential that shade trees be planted upon or about the school grounds. The school yard should be raked and cleaned up, and its accumulated rubbish removed; the fences and gates should be looked after; walks improved, flower beds laid out, shrubs and vines planted about the building and on the grounds. It is a disgrace to any community to own such barrens as are found at many of our school houses, and one leading purpose of Arbor Day is to reform this discreditable condition of things. Let everybody who can do so lend a hand, and all will in a few years have reason to be glad at the happy results that must follow.

We would urge also the necessity of immediate action on the part of teachers and school officers, that the day may be duly observed. To the schools we must look, as time passes on, for the most decided results. Here, by the education of our youth of both sexes, an intelligent interest in the growing world must be awakened, the habit of tree-planting, etc., acquired, and the sentiment in its favor fostered and strengthened. This

is education of the best as well as the most practical character. Let the Teacher or Director in charge of a given school, or the Superintendent in charge of a number of schools, where practicable, arouse interest and secure co-operation by calling a meeting —in the evening, if that be preferred—of the directors and citizens of the vicinity, at which the whole subject can be freely discussed,—the work to be done, school grounds to be improved and planted, trees, shrubs and vines preferred or most easily obtained, best manner of planting the same and personal experience in the work, highways that should be shaded, and village lawns or parks that should be laid out or planted. This may prove to be the inauguration of a movement that can be made to cover, in that locality, the whole ground of the "Rural Improvement Aassociation" upon which a timely article, with full d'aft of the constitution of such society, will be found elsewhere in this number of *The Journal.*

By such concerted action our schools may be able to do a great work not only in adorning their own grounds, but also in stimulating effort towards the adornment of our villages and townships, and in giving to our already beautiful scenery those touches of æsthetic care which mark the presence of a cultured population, and do so much to refine and sweeten the disposition of the young.

In a word: Make preparations some days in advance. Let much of the work of the school during the week have special reference to trees and plants. Let actual planting be done under intelligent direction, both on this and such other days as may be more favorable in different localities. If the school grounds are not properly fenced and in good condition, let this receive prompt attention, as the first step toward better things.

His Excellency, Governor Beaver, is desirous of knowing the approximate number of trees of all kinds planted throughout the State during the present season, and more or less directly as the result of the Arbor Day movement. The best means of obtaining this information is through the reports of the Superintendents of schools of the different counties, cities, and boroughs, to the Department of Public Instruction. Each Superintendent in the State will therefore be expected to make such special report of planting done in the locality under his jurisdiction, with any additional fac's of interest relating thereto, not later than May 20th, as already informed by special circular. We shall be glad to have these reports to the Department as full and complete as it is possible to make them.

THE NATIONAL ASSOCIATION.

THE next annual meeting of the National Educational Association will be held at Nashville, Tennessee, on the 16th, 17th, 18th and 19th of July next. A local State Committee of thirteen members, eleven of whom are citizens of Nashville, the remaining two members being from Knoxville and Jackson, has been organized, with Capt. W. R. Garrett president, State Supt. Frank M. Smith vice-president, Prof. Frank Goodman secretary, and Dr. Geo. W. Price treasurer, to make all the necessary arrangements for the meeting. The Executive Committee of the Association asks that the State officers for the respective states and territories shall do all in their power to so organize effort as to secure a large attendance at the Nashville meeting. The officers of the Association, who constitute the Executive Committee, are President, Supt. Albert P. Marble, of Worcester, Mass.; Secretary, James H. Canfield, of Lawrence, Kansas; and Treasurer, Edwin C. Hewitt, of Normal, Illinois.

Among subjects to be presented are: The History of Education: Its Culture Value, discussed by Prof. B. A. Hinsdale; Its value in educational legislation and administration, by Prof. W. H. Payne; its practical value to teachers, by Prof. S. G. Williams. Manual Training: The results in the St. Louis schools, by Prof. C. M. Woodward; intellectual value of tool-work, by Dr. Wm. T. Harris; practical value in subsequent active pursuits of pupils, by Dr. S. H. Peabody; and effects of its introduction upon the usefulness of schools, by Dr. E. E. White. Literature for Children in the Public Schools, by Miss Mary E. Burt; Legal Status of the Public Schools, by State Supt. A. L. Draper; also, Parochial Schools, the Problem of the Hour for Public Education, Education and the Republic, Patriotic Education, the Peabody Fund, the John F. Slater Fund, etc., are among other subjects that have been announced. The programme is not yet completed, but it is in most competent hands. The Nashville meeting will bring together a very large attendance from both the North and the South, and we have no doubt that Pennsylvania will be well represented.

If anybody wants to visit Mammoth

Cave—and everybody who looks about much ought to see its wonders—this meeting will afford a favorable opportunity to do so. Emerson says he walked into the cave nine miles from the entrance. He must have gone to what the guides call the "Rocky Mountains." In 1869, we went as far as the Snow Ball Room, a chamber of rare beauty, seven miles back from the entrance, where our hungry party enjoyed a lunch of cold chicken, etc., in a banquet hall to be remembered. On leaving the cave, we said that not for twenty years would we see it again. Should we be able to visit it this summer, when the twenty years will have expired, it will no doubt be to see everything unchanged in the wonderful cavern. Let the trip to Nashville include Mammoth Cave without fail.

SCHOOL DIRECTORS IN COUNCIL.

THE DIRECTORS' ASSOCIATION OF CHESTER COUNTY.

THE School Directors in some of our leading counties have organized themselves into Directors' Associations, with permanent officers and semi-annual meetings, for the consideration of all questions relating to the practical management of the schools. Much good has resulted from this comparatively new movement on the part of these influential school officers. County Superintendents can do no better thing for their localities than to arouse the intelligent interest of Directors in the discharge of the duties which have been entrusted to their hands, and one of the best agencies to this end is the County Directors' Association.

We have just received from County Superintendent Walton an account of the proceedings of such association in Chester county, held a few weeks since in the chapel of the West Chester State Normal School, at the invitation of the Principal, Dr. Geo. M. Philips, and the Board of Trustees of the school. Mr. Wm. W. Parker, of Pennsbury, was re-elected president of the body and Mr. Edwin J. Durnall, of East Goshen, as Secretary. In the absence of the Chairman, Mr. H. T. Fairlamb, Dr. G. M. Philips presented the report of the Committee on Closer Supervision, stating that the bill providing for Division Superintendency had been favorably reported by the educational committee of the Senate, and that every effort would be made to secure its passage. The committee was continued, and a petition signed by all the Directors present, requesting the Legislature to act favorably upon the measure.

By invitation of the Executive Committee Messrs. T. R. Williamson, of West Chester, a practical architect, and E. F. Bertolette, of Phœnixville, were present for the purpose of giving their views in reference to the proper building, lighting, heating and ventilating of school houses, and the repairing, ventilating and heating of old school houses. Mr. Williamson thought that the window surface should be as great as one-fifth of the floor surface, and when possible the light should fall upon the pupil's back and left shoulder. The rural school house lighted from both sides is not undesirable.

To keep the air pure in the average school room an entirely new supply of warmed fresh air should be received three times every hour. The absence of this is shown by the sturdy sunburned children who are sent into the schools in September, coming out in the Spring pale and languid. The ordinary box school house, heated by an egg stove, might have its ventilation improved by conducting cold air through a conductor under the floor, and receiving air from either side of the house as desired. This cold air should be admitted under the stove into a hot-air jacket surrounding the rear half of the stove, where it becomes warmed before entering the room at or near the top of the stove. This plan secures a fair supply of pure warmed air without the risk of a draft of cold air upon any one.

The impure air in the school room can, in a measure, be drawn out by surrounding the stove-pipe with a larger warm-air pipe opening into the attic, the current constantly passing upward along the heated stove-pipe carrying a part of the impure air out of the school-room. New school houses that are to be heated by a hot-air furnace in the cellar, should have the floor laid upon a double set of joists, the upper three-inch running at right angles with the lower six-inch joists, so that when the cellar ceiling is plastered there will be a free circulation of air beneath the floor. This apartment should have several openings along the sides into the school room above, and at the same time it should connect with the flue used by the furnace, thus drawing the impure air out of the lower part of the school-room, warming the floor and sending off impurities through the heated flue. This plan of floor ventilation would add but

little to the ordinary cost of building,—in the average school house heated by a furnace, probably not more than twenty-five dollars.

It was ordered, on motion of Dr. Philips, that a committee be appointed to obtain the best plans for improving the heating and ventilating of our present school houses, as well as plans for new buildings, and to have the same published by the Bureau of Education in Washington. A motion was also adopted that the Department of Public Instruction be requested to publish a work on school architecture. Supt. J. S. Walton, and Messrs. T. R. Williamson, H. M. Ruth, J. P. Thomas, and Henry Marshall, were appointed as above. They will meet in July for the pupose of bringing together the material for publication.

The next subject prepared by the Executive Committee was "A Graded Course of Study," Supt. Walton said it had been in operation but a short time in most districts. Its advantages were very decided. Mr. Cleaver spoke of the great success of the graded course in his district. Mr. Friday said it had been a success in Schuylkill township; he referred to the examinations and promotions. He advised all Boards of Directors to adopt the graded course. Mr. Walker, of Tredyffrin, said that they had not yet adopted the course, but were thinking of doing so. The Secretary, Mr. Durnall, read a letter from a member of the board of West Brandywine, where the course had been adopted. He spoke of its success in his township. His children, he thought, made as much progress in one month as in two under the old method. Mr. Cleaver thought it did much to encourage regular attendance. Mr. Durnall gave some figures in support of this fact. Mr. Frederick asked who was to do the examining in the graded course. Mr. Cleaver replied that the teachers do not examine their own work. All the teachers see the work, but the teacher does not pass judgment upon her own work. The Chairman, Mr. Parker, said that in Pennsbury, where the course had been in operation two years, they have no examinations, but the teachers make the promotions, and when the pupils finish the course, the Superintendent makes the examination and the diploma is then awarded. On motion the County Superintendent was requested to send a copy of the plan of a graded course, together with a resolution from this association, to each of the officers of the School Boards of the county.

The following was also adopted:

Whereas, It appears that every school district here represented which has tried the graded course of study has found it to be of great advantage to the schools, therefore,

Resolved, That we urge every district which has not yet done so to adopt such a course.

Dr. Philips said that he would be very glad to have the Association hold its future meetings in the Normal School chapel, if they saw fit to do so. After some arrangements for meetings of the several committees and some pleasant discussion and words of encouragement to the cause, the Association adjourned, having had a very harmonious meeting, and the members feeling that they had accomplished much good.

MEETING AT WASHINGTON.

THE session of the Department of Superintendence of the National Educational Association, held at Washington, D. C., March 6th, 7th and 8th, brought together a hundred or more superintendents and others engaged in educational work, representing nearly every Northern State and a number of Southern States. Among those from Pennsylvania were: Superintendents Geo. J. Luckey, of Pittsburgh; L. O. Foose, of Harrisburg; W. H. Shelley, of York; Wm. W. Rupert, of Pottstown; Miss Tillie S. Booz, of Bristol; D. S. Keith, of Altoona; M. G. Brumbaugh, of Huntingdon county; Geo. A. Spindler, of Washington county; W. S. Jackman, Principal of the Pittsburgh High School; Principal Theodore B. Noss, of the State Normal School at California; E. O. Lyte, of Millersville; G. M. Philips, of West Chester, and State Supt. E. E. Higbee.

The session was opened by an inaugural address by the president for the year, Fred. M. Campbell, of Oakland, California, followed by an address of welcome by J. W. Holcombe, chief clerk of the National Bureau of Education. Among the papers read, those which awakened the greatest interest and were the most earnestly discussed, related to Normal Schools, Teachers' Institutes, and Manual Training.

Prof. W. S. Jackman, of Pittsburgh, read a paper on "City Training and Practice Schools." Notwithstanding that our schools are in a better condition than ever before, there is a lack of confidence in them as a means of training. The cause of this lies either in the character of the studies or in the methods of instruction. There is a dangerous tendency to adopt the former view—

dangerous, because it sets up industrial training as practical, against what we now have as not practical. The training school must educate its pupil-teachers, and they the public, to a broader conception of the needs of the youthful mind. Industrial training has a proper place in the schools, but the world wants character; and if teachers have failed to develop it in the past with history, literature, science and mathematics, they may fail to do it in the future with other means proposed. The present need is that the lessons of the school-room be presented to the pupil much as the lessons of life will be presented to him; yet they need not and, indeed, cannot be the same lessons.

A practice school is indispensable, and in it the teacher must learn his weakness and make his first blunders. The training school should be ideal in its appliances for rendering instruction concrete, and the practice teacher should have access to proper material, that he may construct illustrative apparatus for himself. The course of the training school should be so comprehensive and thorough, that its graduates can well be offered permanent places at salaries which will maintain them through life, and from which by thrift they may lay up a competence for their declining years.

"The Purpose and Means of City Training Schools" was the subject of a paper read by Dr. S. S. Parr, dean of the Normal School, DePauw University, Greencastle, Indiana. In the course of this paper Dr. Parr referred with disapproval to the shortness of the usual course of training in these schools. Out of twenty-five courses of study inquired into, sixteen are one year in length; five are one and one-half years; one is two years; one, three years; and two are four years long. Schools having a one-year course, as a rule, spend one-half of this time in practice teaching. This reduces the time given to professional study to something like twenty weeks. In this short period the student is expected to acquire a working knowledge of educational psychology, method, school economy, and the history of education. That amount of time is not sufficient for any one of them. In all except three of the twenty-five schools, graduation from high school, or its equivalent, is the condition for admission.

Supt. A. G. Lane, of Cook county, Illinois, spoke on "The County Institutes." He gave statistics, showing the cost of these Institutes and the percentage of teachers attending them during the present year in several of the States. A comparison of the reports from twenty-eight states, having an aggregate teaching force of 276,000, shows that on an average one-half of the teachers attend the Institutes.

Teachers' gatherings have been common in many sections of the country for forty years, and have been instrumental in making many teachers realize that their work is one demanding the highest order of talent and the broadest preparation, and they have raised in the public mind a limited sentiment of appreciation for skilled teaching. But skilled teachers are scarce; the demand exceeds the supply. The greatest demand is for a better knowledge of the objects and purposes of an education, and of what constitutes real power in school-training. Yet teachers are apt to become indifferent, and do not avail themselves of the opportunities offered for their improvement. Let competent Institute instructors be provided, and let attendance be a necessity to those who may desire to teach. The officer charged with the duty of examining teachers and issuing certificates, has the power to secure a full attendance by recognizing and aiding those who manifest professional skill and ability. Make the Institute of positive value to teachers, and they will attend. The efficient and successful instructors in Normal Schools, the most successful and practical teachers in the schools of the State or county, and such other persons as shall be authorized by the State Superintendent of schools, should be employed as teachers.

In the discussion which followed the reading of this paper, Dr. Higbee said that no uniform and fixed laws can be formulated to regulate the instruction to be given in our County Institutes. Our States differ so much in their educational conditions and necessities that uniformity is out of the question. In his own efforts, he had kept three things mainly in view: 1. That the Institute may arouse public attention to the educational work of the county, the need of which must be apparent to all. 2. That the Institute may keep up a vigorous sense of professional life among the teachers. 3. That the attention of the teachers may be turned by scholarly men to broad themes of thought and inquiry, thus to overcome the too narrowing pedantry of the school-room, in the interest of a freer, fresher life of thought, and a firmer handling of the various topics of study. The personal advancement of the teachers in all the various elements of culture, he has felt to be very important, and he has also striven to make

the Institutes the means of deepening the sense of responsibility in the teachers, as having under their care living souls, destined to lives of usefulness here and blessedness hereafter.

In a paper on "State Teachers' Institutes," Hon. John W. Dickinson, secretary of the Massachusetts State Board of Education, sketched the history of the Institute, its origin and development, particularly with a reference to his own State. The first idea of a Teachers' Institute originated in a teachers' convention held in Tompkins county, New York, in the year 1843. The first Institutes were organized and supported by their members. The success of these voluntary associations suggested to Horace Mann to try the experiment in Massachusetts. With the aid of one thousand dollars, contributed by his friend, Hon. Edmund Dwight, he held, in the autumn of 1845, the first Teachers' Institute in Massachusetts, at Pittsfield, encouraging attendance by paying the boarding of the members. The Governor was present and became interested. The State Legislature, at its next session, acting upon a recommendation of the Governor, passed, by a nearly unanimous vote, a generous appropriation for the support of Institutes in various parts of the State, under the direction of the State Board of Education. Since then the Institute has been a State institution.

The early Institutes were conducted after the manner of a public school. The members were formed into classes; they were required to prepare lessons and to recite them, and in other respects they were subjected to the usual school regulation. The expenses of the members, while attending, were paid by the State, and their wages by the town, as though they were doing their regular school work. The exercises at this time had less to do with methods and principles of teaching than with the subjects to be taught. The evening exercises consisted of lectures on subjects of interest to the teachers and to the public in general.

This rudimentary character of the Institute has since been essentially modified. The subjects now taught are: First, the principles of teaching, and the true method founded upon them; second, the application of the method to the various branches enumerated in the list of compulsory studies. It is the duty of the Institute teacher to show that he has provided for the presenting of his subject according to principles already given in the lessons on principles of teaching. Thus it will appear that the work of the Institute is to train its members to teach, rather than merely to give information.

The discussion of manual training was opened in a paper by C. W. Woodward, director of the Manual Training School, Washington University, St. Louis, Missouri. Professor Woodward complained that educators persist in misrepresenting the aim and method of manual training. Those who should know better continue to harp against "teaching trades." Do they, without practical experience of manual training, see deeper into its nature and detect more clearly its tendencies than do we who have studied it practically for years? In manual training, properly so called, no attempt is made to cultivate dexterity at the expense of thought. An exercise, whether with books or with tools, is valuable only in proportion to the demand it makes upon the mind for intelligent, thoughtful work. Manual training multiplies opportunities for personal experiences in the contact with realities. But one gains not by personal experience alone. The experience of the race is recorded in established methods and the appliances of the practical arts. The various laboratories of mechanics, physics, chemistry and drawing give him a modicum of personal experience with which he may interpret and appropriate the experience of others. One need not be anxious lest a boy fail to develop literary tastes. There is not a single influence flowing from manual training that is not manly, enlightened, and favorable to sound learning.

A spirited discussion followed the reading of this paper. Dr. E. E. White, superintendent of schools of Cincinnati, led the opposing forces. He deplored the fact that those who cannot see the utility of tool-training in shops are looked upon as old-fashioned. He believes in the methods of the kindergarten in the study of natural objects. This is the true kind of teaching—is rational and natural in its methods. But he does not think that the sort of manual training recommended for boys of fourteen meets the existing demand for reform in the methods of teaching. A paper read by John D. Ford, U. S. N., Principal of the Manual Training School of Baltimore, Md., on "How shall Manual Training be introduced into the Graded School?" discussed the question at some length, and urged the introduction of such training for the reason that, in the absence of the apprentice system, which has been swept away, proper provision should be made for instruction of children in the various lines of handicraft.

OFFICIAL DEPARTMENT.

DEPARTMENT OF PUBLIC INSTRUCTION,
HARRISBURG, April, 1889.

JOHN W. SNOKE has been commissioned Superintendent of Lebanon county, in place of W. B. Bodenhorn, deceased. His post-office address is Annville, Pa.

PERRY A. SHANOR has been commissioned Superintendent of McKeesport, in place of Charles W. Deans, resigned.

W. G. RUSSELL, Ex-Superintendent of Butler county, has been appointed to fill the unexpired term of J. L. Snyder, who resigned in order to accept the Principalship of the 5th Ward, Allegheny City. Mr. Russell's post-office address is Coultersville, Pa.

ITEMS FROM REPORTS.

ADAMS.—Supt. Sheely: During the past season two new houses were built in Strahan, and one each in Latimore, Mount Joy, and Union. All these are large, comfortable, and well furnished houses, except the one in Union, which, though substantial, is somewhat small and plain, and is supplied with home-made furniture. Mount Joy has taken a new departure in ordering improved patent furniture for the new house built.

ALLEGHENY.—Supt. Hamilton: Stowe township has completed two fine brick buildings, one of four rooms and the other of two. They are fitted up in modern style and supplied with every necessary convenience. The Riverside school in Chartiers township was destroyed by fire.

BEDFORD.—Supt. Cessna: A joint Local Institute of adjoining districts of Huntingdon and Bedford counties was held at Saxton. It was well attended, and all seemed well pleased with the exercises. Local Institutes were also held during the month in Monroe, Pleasantville, and Woodbury, all of which were well attended.

BUCKS.—Supt. Slotter: The directors of Doylestown have decided to build a new house. They will begin work on it as soon as the weather will permit. Two Local Institutes were held during the month; both were well attended.

CAMBRIA.—Supt. Leech: The Local Institutes still continue to attract and interest the people. Great advancement has been made in the teaching of Physiology. Normal classes will be conducted at Coopersdale, Loretto, Carrolltown, and Ebensburg, by graduates of the Indiana State Normal School.

CHESTER.—Supt. Walton: Local Institutes were held at Spring City and Oxford. Both were exceedingly well attended. Inclement weather did not prevent directors, patrons, and teachers from driving ten and twelve miles to attend the meeting at Oxford. Penn township has introduced supplementary readers in all of its schools. Charlton's school-house has been papered, painted, and many ways neatly repaired, adding much to both appearance and comfort. The Directors' Association met at the West Chester Normal School, February 11, holding two sessions. Unusual interest was manifested by the directors and ex-directors present.

DAUPHIN.—Supt. McNeal: During the month I attended Local Institutes at Jacksonville, Millersburg, and Steelton. These meetings were all well attended, especially the evening sessions. At Jacksonville and Millersburg, the exercises were conducted by the teachers of the respective local districts, and were highly creditable to those who took part in them. The Steelton meeting was addressed on Friday evening by Dep. Supt. John Q. Stewart and Prof. J. F. Barton, of the Cumberland Valley Normal School. In many districts the school attendance has been much affected by epidemics of measles, mumps, whooping-cough, and other diseases incident to childhood.

DELAWARE.—Supt. Smith: The directors of Ridley township have opened another school in their new building at Prospect Park. On Friday, February 22d, there was a large meeting of directbrs held at Media. An excellent programme was carried out. Much interest was manifested in the discussions, which were extended to a late hour. By a majority of four, a resolution was adopted expressing the sense of the meeting, that substitutes should receive the full salary, They also authorized the appointment of a committee to act in conjunction with the County Superintendent in the preparation of a uniform course of study for the schools of the county.

ERIE.—Supt. Morrison: Our Local Institutes have kept our teachers wide awake. The average number of teachers attending these meetings has been thirty-five or forty, while the rooms have not been large enough to accommodate the visitors.

FOREST.—Supt. Kerr: Ivison, Taylor & Co.'s Chart has been placed in every school of the county, with the single exception of Barnett district. This supplies a long-felt want in our country schools. Tionesta has also placed a dictionary in each school.

FRANKLIN.—Supt. Slyder: The Local Institute held at Mercersburg was a grand success. It was attended by a large number of teachers and others interested in the cause of education. It was decided that Mercersburg should be one of the places where a Local Institute is to be held annually. At the Friday night session, J. Spangler Kieffer, D. D., delivered an instructive lecture on "Memory" to an appreciative audience. Sickness prevented me from enjoying the pleasure of participating in the exercises of the meeting. All the schools but twenty have been visited once.

JUNIATA.—Supt. Auman: Adjourned Institutes were held at McCoysville, Richfield, and McAlisterville. The attendance was very good. A deep interest was manifested and all took an active part in the work. Local Institutes have been organized at East Salem and Prosperity, and meet every two weeks. The directors of

Tuscarora township visited all their schools in a body. Will the directors of other townships profit by their example?

LACKAWANNA.—Supt. Davis: The P. O. S. of A. at Moscow and Yostville presented a handsome flag to each of the schools of Madison, Covington and Spring Brook. Twenty-one schools have been thus supplied. The flags, besides their value as an object lesson in patriotism, improve the appearance of the schoolrooms very much.

LANCASTER.—Supt. Brecht: With one or two exceptions it is but a few years since the first slate black-boards were introduced into the rural schools of this county. Now about twenty per cent. of our houses are furnished with a superior slate surface, averaging from 80 to 100 feet in area. Judging from the present rate of increase, the next half-dozen years will find two-thirds of our schools supplied with this excellent grade of crayon surface. Nearly all the new houses put up in the last year or two have been supplied. Our people have found, after making a fair test of all the various kinds of boards generally in use, that this surface is not only the best, but without a doubt the cheapest to the district. This seems to be the sentiment of our people upon the black-board question in different sections of the county, and it promises at an early period to displace the old "wooden and plaster" boards, and to give us the finished slate so admirably adapted to the work and to the sight of the pupils.

LEHIGH.—Supt. Knauss: Diphtheria has caused very irregular attendance in a number of districts. At Evans, Alburtis and Newtown the schools had to be closed for a short time in consequence.

LYCOMING.—Supt. Lose: On the 10th of February Mr. Edward C. Poust, a teacher of the county, was buried. Mr. Poust had taught only three years, but in that time he had made for himself a lasting reputation as a faithful, conscientious teacher. The immediate cause of his death was paralysis resulting from diphtheria.

MCKEAN.—Supt. Eckles: Our County Teachers' Association met recently at Custer City, and was a decided success. Our teachers are interested in the meetings, always excepting the few who think they know too much to learn anything at a teachers' meeting. It is in our county, as I suppose it is in others, that the best teachers are the ones who attend these meetings.

MONTGOMERY.—Supt. Hoffecker: Local Institutes were held at Kulpsville and at Lonsdale. The attendance at both was very large. The people are becoming thoroughly aroused on the subject of education. We find it difficult to secure a hall large enough to accommodate all the people. Teachers from nearly one-third of the districts of the county were in attendance at the meetings named.

MONTOUR.—Supt. Steinbach: The schools as a whole are in excellent working order. In Anthony township there had existed a prejudice against female teachers. This session there were employed seven lady teachers and one man, with the result that the schools are in better condition than I have ever known them to be. The lady teachers in this district have attended Normal Schools, and to this fact I attribute the good work that is being done. Among all our teachers, I find that excellent work is being done by those who have had Normal School training. Let us have more Normal teachers, and we will have better schools.

NORTHUMBERLAND.—Supt. Bloom: This month was devoted entirely to the visitation of schools. With few exceptions the work done in the schools visited is very creditable. Very commendable improvements in the school buildings of Delaware township were made during the past year: one commodious brick house was erected at a very desirable location, and a number of others were neatly repaired. The Rapho township board recently purchased an excellent set of maps for each of its schools. The Sunbury Board purchased the building, known as Brown's Academy, for $6,000. It will be occupied by the high school.

PERRY.—Supt. Aumiller: District Institutes were held at Newport, Liverpool and Duncannon. At Newport, Rev. W. R. H. Deatrick delivered a very able lecture. Much good has been accomplished at these educational meetings, seven of which have been held at different points in the county. Nearly all the country schools will be closed by the end of March.

POTTER.—Supt. Kies: The semi-annual meeting of the County Teachers' Association was held this month. The attendance was large throughout the entire session. The programme was noticeably interesting, especially the parts performed by the pupils of the district. The Wharton district Teachers' Association held its regular monthly meeting at Austin. Sylvania has arranged an attractive and commodious two-story building at Castello, and effected a partial grading of the school. Most of the short winter terms close March 1st. Several districts, that have hitherto had two terms, will arrange for a continuous term next year. This is one of the best signs of educational advancement in the county.

SNYDER.—Supt. Herman: A Local Institute was held at Beavertown. The sessions were well attended. The teachers entered into the work with energy, and the work done by them shows that they are keeping abreast with the times. A very successful joint Institute was held at Richfield, Juniata county.

SOMERSET.—Supt. Berkey: Four interesting Local Institutes were held during last month—at Meyersdale, Berlin, Stoyestown and Shanksville. The total attendance at these meetings was 109 teachers, 25 directors, and at least 1,000 citizens. At Berlin, Hon. Henry Houck was present and delivered his popular lecture "The Old and the New," to a large and delighted audience. These Institutes are evidently accomplishing much good, and will doubtless be continued next year.

UNION.—Supt. Johnson: With but few exceptions the schools are in a prosperous condition. Two teachers have been dismissed, one for negligence and incompetence, the other for immorality. One school has been temporarily closed because of the prevalence of scarlet fever.

Each district is organized for Local Institute work, and as a consequence much interest and enthusiasm prevails throughout the county.

WAYNE.—Supt. Kennedy: I found most of the schools visited this month in good working order. The new building at Honesdale is completed and in use.

BETHLEHEM.—Supt. Farquhar: The most interesting event of this month was a contest in declamation among eight young masters of the High School. There were two prizes, a gold and a silver medal, offered by Mr. C. H. Wenhold, a citizen of Bethlehem, to stimulate efforts in his direction. The first prize was won by Harry S. Lack, the second by Harry Palm, with honorable mention of Elmer G. Tice and George S. Opp. The other six contestants were, however, rewarded for their efforts by receiving each a copy of Shakespeare's Works. On the same occasion (February 22), the P. O. S. of A., presented a handsome flag to each of the schools. Thus Washington's Birthday was celebrated in a very pleasant and appropriate manner.

MAHANOY CITY.—Supt. Balentine: On the 22d of February, at the close or a fine parade, the Patriotic Orders of the city presented the school district with thirty flags—one for each school room.

NANTICOKE.—Supt. Miller: Our attendance continues small on account of a few cases of small-pox still lingering in the borough. On Washington's Birthday the P. O. S. of A. and Junior Mechanics presented to our schools five very handsome flags. Fitting exercises had been arranged for the High and Grammar Schools, and the day was made the occasion for a general outburst of patriotism in our borough.

POTTSTOWN.—Supt. Rupert: We have just introduced calisthenics into our girls' school, and before long we hope to have such exercises in all of our schools.

SHAMOKIN.—Supt. Harpel: On the 4th of February our new school, the Garfield building, was occupied by the teachers and pupils, who had been looking forward so anxiously for months to the time when they might be comfortably settled in their new quarters. The building is first-class in every respect, being provided with steam heating apparatus, water, closets, and an excellent system of ventilation. It is indeed a credit to our Board and people. During the month about one hundred volumes were added to our school library, and a complete set of Johnson's wall maps was placed in the new building.

SHARON.—Supt. Canon: On February 19th, the Order of Junior Mechanics presented the public schools with American flags. Three hundred school children sang patriotic songs in the presence of a thousand people. The presentation speach was made by L. A. Burrell, Esq., which was responded to by Thomas Tanner, Esq., president of the School Board.

SOUTH BETHLEHEM.—Supt. Wilt: At a public meeting held in Excelsior High School Hall, February 27, the P. O. S. of A. presented the school with American flags. Appropriate addresses were made by the presiding officer, Mr. Wm. Packer, and Mayor Kinney of Reading. The latter gentleman, in language of the warmest patriotism, presented the flags, twenty in number, to the school authorities. Supt. Wilt, in behalf of the Board of Directors, accepted the same, and in appropriate words returned the thanks of the directors, teachers and pupils to the P. O. S. of A., for their most valuable and patriotic donation.

STEELTON.—Supt. McGinnes: At a special meeting of the Board it was decided to erect two new school-houses. These buildings will correspond in general arrangement and completeness with the substantial building put up in the first ward a year ago.

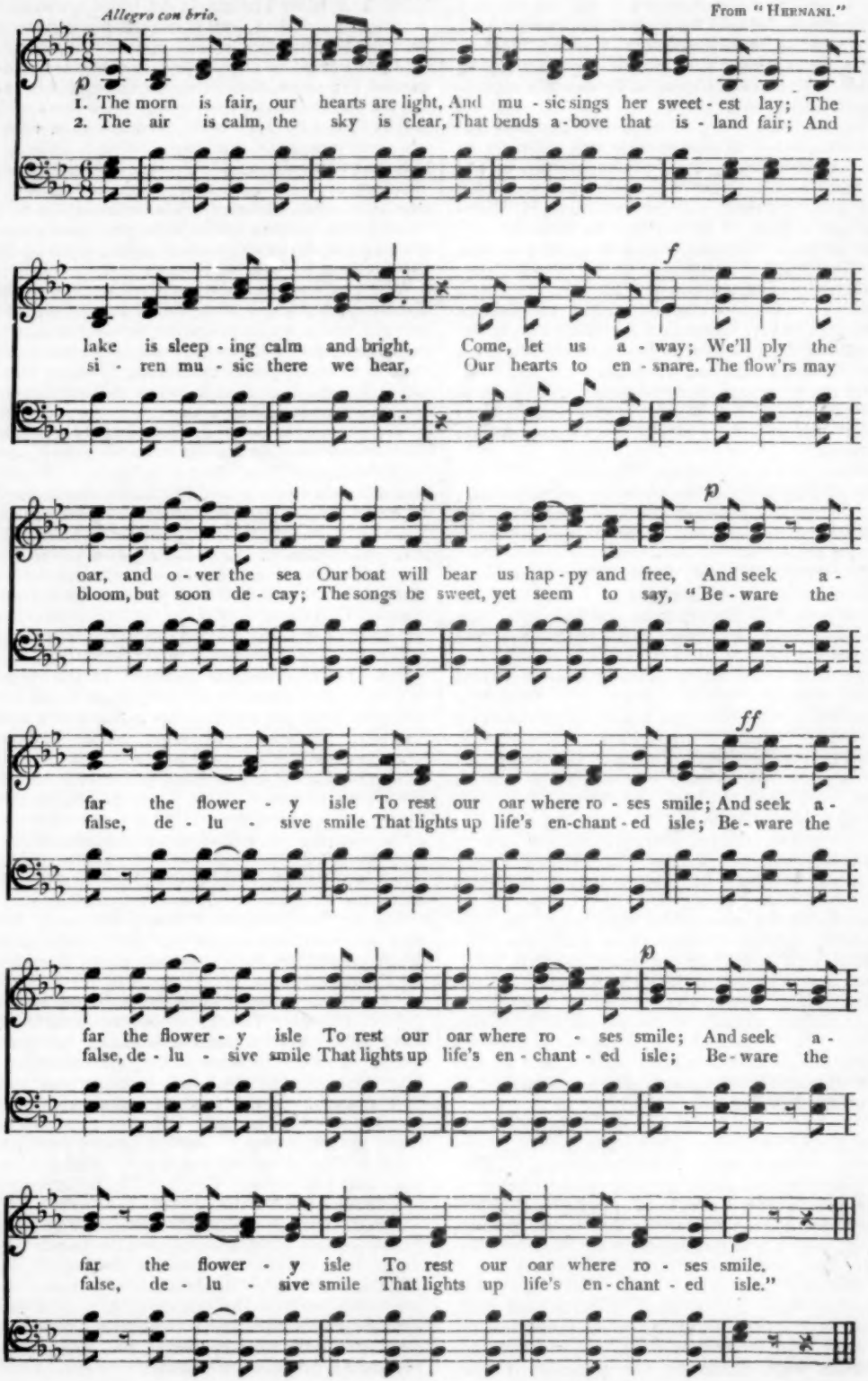
WEST CHESTER.—Supt. Starkweather: On Saturday, February 16th, there was an exhibit of scholars' work in every department of study, so far as it could be presented on paper, from that of the youngest to the oldest. Fifteen hundred persons inspected it, were enthusiastic in praising the idea, and were exceedingly gratified.

WILLIAMSPORT.—Supt. Transeau: Our school district has sustained a severe and heavy loss in the death of Miss Fanny S. Nash. A little more than a week before her death. she seemed to be in the full enjoyment of physical health, but she took cold, which turned into pneumonia and ended fatally. For twenty-two years this estimable lady was prominently connected with the public schools of this city. She was a graduate of Dickinson Seminary, and soon after her graduation she was elected teacher of a primary school. Her promotion was rapid, and for years she was second assistant in the High School. Her talents and education fitted her admirably for the work of her noble and unselfish life. She had great natural ability for literature and art, and if she had devoted her life to its cultivation might have gained for herself a wide reputation. Miss Nash had the happy faculty of winning the confidence and affection of her pupils, She had exalted views of life, and this made her influence pre-eminently for good in the school. She did a noble and lasting work in this city. Peace to her ashes!

HAZLE TWP.—Supt. Fallon: February 22d was properly celebrated by the residents of Hazle township, as it was made the occasion for the presentation, on the part of the P. O. S. of A., of forty handsome U. S. flags to the public schools. Thanks to the Order for their kind gift. Our schools are doing excellent work. The teachers are putting all their energy into their schools. A Local Institute was held at Hazleton. There was a general turnout of patrons at every session of the Institute, which was a grand success. Local Institutes were also held in the adjoining districts of Butler, Conyngham and Black Creek. These meetings are doing a good work.

PLYMOUTH TWP.—Supt. Gildea: Township Institutes are held monthly. The merits and demerits noted during visits are thoroughly discussed, with very beneficial effects upon the teachers' work in the school-room. The four schools which had to be closed on account of small-pox have been reopened, and things have resumed a progressive attitude.

THE ENCHANTED ISLE.

Allegro con brio. From "HERNANI."

p
1. The morn is fair, our hearts are light, And mu - sic sings her sweet - est lay; The
2. The air is calm, the sky is clear, That bends a - bove that is - land fair; And
lake is sleep - ing calm and bright, Come, let us a - way; We'll ply the
si - ren mu - sic there we hear, Our hearts to en - snare. The flow'rs may
f
oar, and o - ver the sea Our boat will bear us hap - py and free, And seek a -
bloom, but soon de - cay; The songs be sweet, yet seem to say, "Be - ware the
p
ff
far the flower - y isle To rest our oar where ro - ses smile; And seek a -
false, de - lu - sive smile That lights up life's en-chant - ed isle; Be - ware the
p
far the flower - y isle To rest our oar where ro - ses smile; And seek a -
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far the flower - y isle To rest our oar where ro - ses smile.
false, de - lu - sive smile That lights up life's en - chant - ed isle."